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Original Communications.

HYGIENIC THERAPEUTICS—A LECTURE ON KINESITHERAPY.

By Professor Dujardin-Beaumetz, Paris, France.*

Gentlemen:—Last year, in a series of lectures, I undertook the study of alimentary hygiene; this season I intend to complete the subject of hygienic therapeutics by considering the benefits derivable from movements and exercise, air, water, and climate in the treatment of diseases. In the present series, then, I shall successively treat of kinesitherapy, massage, hydrotherapy, aerotherapy, and climatotherapy. I hope to show you that these hygienic agents, as well as alimentation, have an important and often preponderant rôle in the treatment of a great number of affections; I hope also that you will receive with the same interest and the same indulgence this second part of my course on hygienic therapeutics.

I shall begin by the study of exercise and of movement as applied to the treatment of diseases. To the sum of these curative means has been given the name of *kinesitherapy* (from *χίνησις*, movement, and *θεραπεία*, treatment). I shall devote this first lecture to the history of gymnastic therapeutics, and the physiological phenomena developed by movement; then, in

* Delivered in Cochin Hospital, and printed from advance sheets.

the next lecture, we shall complete the subject by the examination of the methods and modes of application of kinesitherapy.

I do not intend to go over the entire history of gymnastics; you will find in the Report of Hillairet, in Collineau's "Gymnastics," and in the treatise of Dr. Chancerel on "Medical Gymnastics," published in 1864, all the more important data connected with kinesitherapy.* But it is especially in that remarkable work of Dally, Sr., entitled "Cinésiologie," from which all subsequent writers in this department of therapeutics have drawn so largely, that you will see an exhaustive handling of this whole subject. Finally, in the article of Dally, Jr., in the "Dictionnaire Encyclopédique," you will find much valuable information on this matter, and this especially from a physiological point of view. I shall, then, content myself with giving you a brief summary of the leading facts in the history of medical gymnastics, being persuaded that such an abridged statement will not be devoid of interest and profit.

Prehistoric man, as I told you in my last year's course, can hardly be said to have employed, in the treatment of diseases, any agents except such as are derived from hygiene, and among these must be included movement and exercise. Obliged to contend against the inclemency of the seasons, and against animals physically better endowed than himself in the struggle for existence, primitive man was obliged for his own support and defence to devote himself to a kind of natural gymnastics, which gave him extraordinary strength and agility. There is evidence, also, that he was fond of those dances which are now so common among all savage tribes, as the Australian, the Neo-Caledonian, the Tasmanian; dances inspired, according to Letourneau, by the chase or war. In their hunting dances, these primitive men imitate the actions of the animal which they are wont to pursue, and all the exciting details of the chase; it is a dance of joy and hilarity. As for the war-dance, all savage tribes are wont to prepare themselves for the battle by a pantomimic rehearsal of the fight, and there are innumerable forms of the martial dance, from the cannibal war-dance of the Neo-Caledonian to the Pyrrhic of the Greeks.

These war-dances are interspersed with chants, and one of the most curious is that which De Rochas has put in the mouth of the Neo-Caledonians: "Shall we fight the enemy? Yes. Are they strong? No. Are they valiant? No. Shall we eat them? Yes."

But at the very dawn of human history, it is among the inhabitants of China and the Indias that we find the first indications of the co-ordination of elements derived from exercise and movement for a determined hygienic purpose. Nearly three thousand years before the Christian era, under the reign of the Emperor Hoang-Ti, appeared a treatise entitled "Cong-fou, or the Art of Man," where were set forth at length all the principles of gymnastics, and even the application of the latter to the treatment of disease. The precepts therein inculcated are in accordance with the Chinese maxim: "Perfect thyself; renew daily thy substance; renew perpetually thy vigor."

The "Cong-fou" insists at great length on the necessity of respiratory gymnastics, and endeavors to explain this necessity from physiological reasons. According to this Chinese book, it is exercise which establishes the equilibrium of respiration, and respiration keeps up the proper adjustment in the movements and composition of the blood. "Respiration," adds this ancient hygienic writer, "changes the composition and proportion of the principles of the blood." It is worthy of remark that these statements are in harmony with modern science.

I shall not here reproduce all the details which this book gives relative to movements to be practised. It prescribes three attitudes or postures, and these admit a great number of varieties. Three ways of breathing are indicated,—one by the mouth, another by the nose, the third by the mouth for inspiration and by the nose for expiration. These forced breathing exercises are as much in use to-day as they were forty-five hundred years ago when first prescribed.

We who belong to the Indo-European family are especially interested in knowing what the Hindoo race knew relative to the gymnastic art and its applications. When the white men, the *Pandous*, sixteen centuries before the Christian era, had driven out the black men, the original occupiers of the soil (the *Kourous*), the Vedas appeared,—the sacred books of the nation, supposed to have been a revelation from Brahma. Among

* Dally père, "Cinésiologie ou science du mouvement dans ses rapports avec l'éducation, l'hygiène et la thérapeutique," Paris, 1857; Dally fils, art. "Gymnastique," in "Dictionnaire encycl.;" Hillairet, "Enseignement de la gymnastique dans l'Université, 1878;" Collineau, "la Gymnastique," Paris, 1884; Chancerel, "Histoire de la gymnastique médicale depuis son origine jusqu'à nos jours" (Thèse de Paris, 1864).

these Vedas there is a book called the "Ayur-Veda, or Science of Life," which is devoted to medicine.

According to the mythical tradition, an ancient sage, Bahradwaja, to remedy the ills and infirmities which afflicted humanity, demanded help of Indra, who kindly granted the prayers of the sage and taught him the precepts of the "Ayur-Veda."

This "Ayur-Veda," the most ancient book of Hindoo medicine, is divided into eight chapters, one of which is devoted to alimentation and to hygiene. These precepts of the "Ayur-Veda" have been reproduced in the work of Susruta, where they may now be seen. You will find also in the "Code of Manou," compiled about 1300 B.C., much valuable information respecting the hygiene of the Hindu nation. You will there observe, as in the "Cong-fou," precepts concerning frictions, massage, ablutions, and rules for breathing.

The sixth book of the "Laws of Manou" says in express terms, "The Sanniasi (devotee), to purify himself, must bathe and hold his breath six times; he effaces his sins by holding his breath." By the side of these religious rules we must also place the dances which were practised at the doors of the temples, and which you will find described in the recent work of Dr. Edmond Dupouy. These dances, performed by Indian priestesses (bayadères), made part of that assemblage of practices to which has been given the name of sacred prostitution.*

From India the practice of gymnastics was carried over to Egypt, and there maintained its sacred and military character. Writers have especially insisted upon the military character of gymnastics, and under the name of *Agonistics* were included a variety of martial feats and dances. The study of the monuments of Egyptian antiquity leaves no doubt as to the development and importance which these dances and these exercises had acquired in the social education of the Egyptians. You will find in the works of Champollion-Figeac, and especially in the treatise which Krause has devoted to this subject, much valuable information respecting these exercises.

We come now to Greece in the day of its glory, and we may also say, to the time of the highest development of gymnastics as applied to the perfecting of the body and to the treatment of divers diseases. Admirers of physical beauty, of which the ancient statuary has given us immortal examples, the Greeks carried, as far as possible, the application of exercise and of movement to the vigorous and well-proportioned development of the body, and in the education of their youths and in the training of adult life, the efforts of this ancient people had this one end in view, "To put the soul of a sage into the body of an athlete."

The Olympian and Isthmian games, by the almost divine honors bestowed on the conqueror, show us the importance which all Greece assigned to gymnastics. St. John Chrysostom tells us, in fact, that when the athlete Exanetus returned victorious from the Olympian games, his fellow-citizens made a breach in the walls of his native city to give entrance to the three hundred white horses and their chariots which formed the triumphal procession.

We have quite exact data respecting the Grecian gymnastics, and you will permit me to state rapidly the principal facts. The Greeks divided gymnastic exercises into four classes. There were first the natural exercises, racing, leaping, swimming, walking, wrestling; these were called *palestrics*, from παλαίω, to wrestle. Then came movements with military arms; this kind of gymnastics was called *oplomachia;* religious dances constituted *orchestrics;* lastly came *medical gymnastics*, which formed an important branch of the art of healing.

The gymnasia where the Greek youths exercised themselves, and where also philosophers gave instruction, were immense and magnificent buildings, where were accumulated the most beautiful specimens of ancient statuary and Attic marble. Athens had four of these great gymnasia,—the Academy, the Lyceum, the Ptolemion, and the Cynosarge, the latter being reserved for the lower classes and for slaves.

There, under the direction of the *gymnasiarchs*, the young men of Greece engaged with enthusiasm in all sorts of physical exercises. Men and women practised gymnastic exercises completely naked, for the Greeks associated the idea of exercise with that of nudity, as the name *gymnastics* (from γόμνός, nude) implies. Without doubt, it is to the practice of these exercises, and this habit of performing them naked, that the Greek sculptors were able to find in the gymnasia models of all that we to-day consider as the ideal of physical beauty.

Herodicus, one of the teachers of Hip-

* Dupouy, "La prostitution dans l'antiquité."

pocrates, was the founder of medical gymnastics. Having experienced in his own person the good effects of exercise, in being thereby cured of a disease regarded as incurable, he recommended it for a great variety of affections, and carried to the extreme the precepts of gymnastics. Thus, to fever patients he ordered a walk from Athens to Eleusis by way of Megaris, and back again without stopping, which represents a distance of thirty-three kilometres, or about eighteen miles, one way; this would make altogether a pretty long walk of sixty-six kilometres for a patient in a febrile condition. Hence it is that his pupil Hippocrates blames Herodicus, and affirms that often persons succumbed to the effects of these forced exercises.

After Herodicus, next in order comes Iccus. While the former was pursuing his vocation at Athens, Iccus was filling the office of medical gymnasiarch at Tarentum. He was the first to conjoin with the exercises to which the athletes were subjected, a special dietary regimen, thus laying the foundations of physiological training.

Disciplined or trained for an exclusive end, veritable products of the gymnasium, the athletic champions of the Olympian or Isthmian games presented but a moderate resistance to the fatigues of hard labor, and especially to those of war, and made but middling soldiers. Hence it is that Hippocrates, who has so well summarized the precepts pertaining to the application of movement and of exercise to the treatment of diseases, protests strongly against the abuses of gymnastics, and his view is summed up in the following aphorism: "It is from the exact proportion between exercise and health that the harmony of the functions arises."

Greek medicine made every way great account of movements and of exercise in the treatment of diseases. Hence Littré, with good reason, considers medical gymnastics as one of the three sources of Greek medicine, the other two being furnished, the one by the precepts of the priests of Æsculapius, the Asclepiades, the other by the teaching of the philosophers, who, as you know, gave the study of medicine a place among the branches of knowledge which they imparted. For a time the Asclepiades had few followers, and almost everybody frequented the gymnasiums, where were found together the gymnasiarchs and the philosophers.

You will find in one of the writings of Hippocrates, a passage which well expresses the notion which was held respecting the action of gymnastics in the treatment of diseases: "The fullers trample their fabrics under their feet, they wring them, they beat them, they wash and scrub them, and toughen them, removing all their impurities, and it is the same with regard to our bodies, and this is the good which we get from the practice of gymnastics."

In passing from the Greeks to the Romans, gymnastic exercises underwent a transformation. It was no longer the supreme end to attain the ideal of physical beauty, but the predominant desire was, on the one hand, to make soldiers; on the other, gladiators. In annexing baths to the gymnasia, an innovation borrowed from the East, the Romans completely modified these establishments, which little by little became places of debauchery, and they thus prepared the people for the ages of decadence and degeneration which followed; and all this notwithstanding the efforts of Antonius Musa, physician to Augustus and of Charmis of Marseille, who founded hydrotherapy, and substituted for vapor-baths and warm baths the usage of cold water. All the physicians of the Roman period (physicians of Greek origin be it understood) taught the utility of exercise in the treatment of diseases, and you will find in the celebrated collection which Oribasius made in A.D. 360 (under the orders of Julian) of all the writers of antiquity who treated of medicine, an entire book devoted to gymnastics; this work has been translated by Daremberg. You will there see the principal indications formulated by the ancients for the application of gymnastics to the treatment of diseases. There are, moreover, some very interesting paragraphs on respiratory gymnastics.

According to a passage of Antyllus, cited by Oribasius, the act of declaiming with a loud voice has for effect to dilate the thorax and augment the respiratory capacity, but such declamation should be prohibited in cases of hæmoptysis.

According to Galen, also cited by Oribasius, exercise is *all movement whose effect is to change the respiration.* The physician of Pergamus also dwells on the importance of all gymnastic exercises, and, furthermore, of frictions, massage, and even of passive movements, which, in his practice, constituted a veritable Swedish movement cure which was applied to the treatment of fevers.

Leaving the fourth century, we find no writers worthy of note till we come to Aetius in the sixth century, Alexander of Tralles and Paul of Ægina in the seventh century, who

reproduce in their compilations almost the entire work of Oribasius. Then thick night fell on all that pertained to the arts and sciences, a night which lasted till Europe, emerging from out the Middle Ages, saw ushered in the dawn of a new period,—the RENAISSANCE.

During this long period, constituting the Dark Ages, which extends from the sixth to the sixteenth century, comprehending a thousand years, the practice of hygienic exercises was not abandoned, and we see it put in use in the training of knights-errant, and while one set of men shut themselves up in cloisters, and there submitted to the rigorous rules of asceticism which were enforced in these places, others, on the other hand, gave themselves up with ardor to physical exercises, and constituted that chivalry which, if it did not create artists and men of science, nevertheless gave the world strong and vigorous men, capable of bearing the heavy accoutrements of war, and an amount of massive and weighty armor such as fills us with astonishment at the present day.

The Arabian school, which alone preserved during this long space of time the traditions of antiquity, added nothing to the practice of the ancients, manifesting rather degeneration than progress, and in the works of Rhazes you will find but a few short passages pertaining to medical gymnastics.

Coming down to the sixteenth century and the Renaissance, we find awakened a zeal for revising and collating the masterpieces of antiquity, of which collections from all sources were made. In this work of research and annotation, due place was given to gymnastics. Thus, Antonio Gazzi, of Padua, in his "Florida Corona" (Floral Crown), which is, he says, "composed of the most beautiful flowers gathered in the fields of Hippocrates and Galen," has not omitted to compile all that has a bearing on hygiene, and in particular, on gymnastics. Lastly, in 1573, at the end of the sixteenth century, appeared the first special treatise on gymnastics, the production of Mercurialis, who was, as Hillairet has well said, the father of modern gymnastics.

But it is not so much in the works of medicine properly so called, or of hygiene, that you will observe precise indications respecting gymnastics. You will find the importance of bodily exercises recognized, and valuable lessons thereon, in the writings of the philosophers, and especially of the great reformers, who endeavored to introduce sage innovations into the education of the youth, and among these I may mention Rabelais, Martin Luther, and Montaigne.

In his immortal work, Rabelais dwells much on the necessity of gymnastic exercises in the education of his *protégé*, the young Gargantua, and we there find the precepts of the ancients accommodated to the tastes of the period. He insists particularly on the utility of respiratory gymnastics, which he says develop and strengthen the organs and muscles of the thorax.

Luther, the father of the Protestant Reformation, is quite as affirmative on the subject of the necessity of gymnastics for the preservation of the health. Gymnastic exercises, he says, give strong and robust limbs, and promote the health of the whole body. Youths who are interested in them will not be likely to abandon themselves to lazy habits, to debauchery, to strong drink, or to card-playing. Our great philosopher Montaigne has a striking passage in his letter to Diana of Frix, Countess of Gurson, in which he sets forth in a clear manner the importance of making the physical training keep pace with the moral; and I cannot but think, with Dally, that it would be well if the entire passage were printed in large letters on the walls of our schools: "It is not a soul, it is not a body, that you are developing, it is a man—and you are not to treat them as if they were separate, or cultivate the powers of the one without at the same time cultivating those of the other. They should, in fact, be managed like a pair of horses harnessed together."

Such were the views of the reformers of that time, but these precepts bore no fruit in the way of gymnastic institutions, despite the earnest pleading in behalf of a better system of physical training, at a later day, by Rousseau, who, in his "Emile," again urges the necessity of bodily exercises, and compares gymnastics to dancing, then much in vogue, and to the disadvantage of the latter, which he affected to despise.*

I must not omit in this connection to mention the names of Nicolas Audry and Tissot. The phlegmatic dean of the Faculty, sworn adversary of the surgeons, whose thesis bore the strange title: "On the Influence which the Cheerful Demeanor of the Physician and the Obedience of the Patient may have on the Cure of Diseases,"—Nicolas Audry, published

* He says, in plain words, that he would rather skip like a roebuck than dance like some of the performers of the period: "J'en ferai l'émule d'un chevreuil plutôt que d'un danseur de l'Opera."

in 1741 a treatise in two volumes on "Orthopædics," in which he rightly insists on the importance of movements and of exercise in the treatment of the deformities of early life. Tissot, who was surgeon-general of the light cavalry, published in 1780 a very complete work on gymnastics, which has more or less influenced all subsequent writers on the subject.

Lastly, at the end of the eighteenth century, and coincidently with the appearance of the works above mentioned, gymnastic exercises acquired a permanent place in all public systems of education, and this salutary innovation was due to one who may be regarded as the true founder of modern primary instruction as instituted on a common-sense basis: I refer to Pestalozzi. In this connection I need but refer to one simple, unpretending treatise of this remarkable man, with this naïve title, "How Gertrude taught her Children,"—a book which lays down in a masterly manner the principles of the inductive system of education. Pestalozzi was a Swiss, of the canton of Unterwald, and no place could have been better chosen to serve as the cradle of modern gymnastics. Placed in the centre of Europe, inhabited by a population of mountaineers skilled in exercises of the body, Switzerland adopted with ardor the ideas of Pestalozzi, and there sprang up under the impulse emanating from him, gymnasiums at Stanz, at Berthoud, and at Yverdon, where flocked not only the Swiss youths, but also people from neighboring countries. Gulsmuths, a native of Saxony, became the pupil of Pestalozzi, and carried his method to Germany, while Natchtigall did the same for Denmark, so that at the commencement of this century, three European countries possessed gymnasia,—Switzerland, Germany, and Denmark.

From this time onward, gymnastics became a regular part of scholastic and medical training, and were cultivated in all parts of the world. There are four names in particular which sum up the efforts made in this direction during the first part of the nineteenth century,—Ling, of Sweden; Jahn, of Germany; Clias and Amoros, of France.

Ling, while a student of the University of Upsall, was suffering from retraction of the muscles of one of his arms, which resulted from a wound which he had received in 1801 in a naval battle between the English and Danes. He combated this retraction by fencing, and delighted with the remarkable results which he had obtained, he abandoned his chair of Scandinavian poetry and mythology, to devote himself specially to the teaching of gymnastics. He originated that aggregate of special exercises to which has been given the name of Swedish gymnastics, and which I shall describe at length in the next lecture, when I come to treat of the exercises of gymnastics.

If with Ling, gymnastics became identified with medicine, and to such an extent that he may be regarded as the founder of modern kinesitherapy, with Jahn it took another turn, and became associated with patriotism and military prestige. Jahn desired that gymnastics should help on the triumph of the German ideal, and took for his device: "Liberty, autonomy, our country's glory!"

As for France, it is to Clias and Amoros that we owe the establishment of the first gymnasia. Clias was born in Berne in 1780. He became professor at the academy of this city, then came to France, passed over into England, where he sojourned awhile, then came back to France again, carrying everywhere his precepts of gymnastics. It is especially in a report to the Society of Medicine of Paris that you will find the clearest indications as to what his teaching of gymnastics consisted in.

Amoros was a Spaniard, who, for political reasons, was exiled from his native country. He made France his home, and devoted his life to the propagation of gymnastics. I myself when a boy attended the exercises of Colonel Amoros. These exercises took place in an immense gymnasium, which he had built in the Champs Elysées, in the street which now bears the name of Jean Gougon. Thither Tuesdays and Sundays the pupils of the different boarding-schools were conducted, and when the exercises by section were finished, we were all marshalled together into an apartment, where Colonel Amoros taught us to perform, while singing, those exercises in concert which constituted more particularly the gymnastic system of Amoros.

From the time of Clias and Amoros, gymnastics underwent rapid development in France, and became obligatory in the primary schools, while in the army, the soldiers were taught to execute those concert movements, and those movements tending to give suppleness to the limbs, which so fit them for their special calling.

Among the numerous masters of gymnastics, there is one whom I ought to signalize, especially since all mention of his name is omitted in the otherwise very complete thesis

of Chancerel; I allude to Napoleon Laisné. He was the first to teach gymnastics in the hospitals of children, and under the direction of Blache and of Bouvier, he applied gymnastic exercises in our hospitals to the treatment of convulsive disorders, such as chorea; and to-day, despite his great age, Laisné has not ceased personally to teach and to direct the teaching of gymnastics in our hospitals and schools.

Before setting forth the various methods and their application to therapeutics, I desire to devote the rest of this lecture to a rapid survey of the physiological action of gymnastic exercises. It is on these effects that we base the applications of medical gymnastics.

Gymnastics act first on the circulation and respiration. The effect on the respiration is, perhaps, far the most important, and Dally has emphasized this point; and in this connection I need only recall to your minds the importance which the ancients attached to the influence of exercise on respiration.

In a general way, gymnastic exercises augment considerably the chest capacity. You can judge of the increase of the amplitude of the chest by the use of registering apparatus to measure the respiratory movements.

In a work written conjointly by Chassagne and Dally* at the Military School of Gymnastics of Joinville-le-Pont, these authorities have shown that of four hundred and one individuals subjected to gymnastic exercises for five months, in three hundred and seven (or seventy-six per cent.), the bi-mammary circumference of the thorax had increased by an average of two and one-half centimetres. In Germany, Dr. Abel obtained similar results, seventy-five per cent. of individuals practising gymnastics having experienced an augmentation of the thorax.

Another mode of mensuration consists in applying to the thorax the process employed in craniometry; this is Fourmantin's method. Under the name of *thoracic index*, he gives the centesimal relation of the transverse diameter of the thorax to its antero-posterior diameter, a relation expressed in the following formula: $\frac{DT}{100} \times DAP$.

The flatter the chest, the higher will be the index figure, and the rounder the chest, the less will be the figure, for flattening of the chest corresponds to low development and low respiratory capacity. In phthisical patients, for instance, the thoracic index varies between 135 and 152, while in individuals possessing a sufficient and normal respiratory capacity this index is but 128. Gymnastic exercises tend to lower the thoracic index.

But the instrument which most clearly expresses the amplitude of the respiratory movements is the pneumograph, which enables us, as you may now see, perfectly to enregister the amount of respiratory expansion.

In the interesting researches made by Marey,† "On the Influence of Movement on the Respiration and Circulation," he obtained, by the aid of the pneumograph, tracings which I here place before you, and which show you, better than anything else can do, that under the influence of gymnastic exercises the amplitude of the thoracic movements may be doubled.

This augmentation in the capacity of the thorax has several consequences. First of all, it enables a greater quantity of blood to come in contact with the air of respiration, and this increases the combustions of the economy. It also enables a greater quantity of air to penetrate the lungs. This latter is of capital importance, for this augmentation of the respiratory capacity opposes that breathlessness (*i.e.*, that marked increase of respiratory movements) characteristic of active exercise. Edward Smith has, in fact, shown us, that if we represent by the figure 1 the quantity of air which hourly penetrates the lungs (five hundred and forty litres) in an individual lying down, this figure will augment in the following proportions, if the individual devotes himself to the exercises below specified:

Standing	1.33
Moderate walking	1.90
Rapid walking	4.76
Horseback-riding	2.20
" galloping	3.16
" trotting	4.05
Swimming	4.31
Rapid running	7.00

In order to cause a sufficiently large quantity of air to penetrate the lungs during the corporeal exercises which I have just enumerated, such an augmentation of the ordinary movements is required, that breathlessness is rapidly produced in persons who are not habituated to these gymnastic exercises. But, as I have just told you, gymnastics, by augmenting the respiratory capacity, enable the individual to breathe in more air with each respiration,

* Chassagne and Dally, "Influence of Gymnastics on the Development of Man," 1881.

† Marey, *Acad. des Sciences*, July 10, 1881.

and thus lessen the number of respirations and avoid getting out of breath.

In the tracings which I have just shown you, you saw that the pulse was also indicated, and that exercise augments both the number of the pulsations and their amplitude. This influence of gymnastics on the circulation is quite as important as their influence on the respiration. The greater activity of the circulation results from two causes,—first, the muscular contraction; second, the increase of pulmonary capacity.

Muscular contraction energizes the venous circulation. We have a proof of this in the operation of blood-letting, when, in order to obtain a freer flow of blood from the open vein, we tell the patient to execute with the hand movements which bring into play the muscles of the forearm. The enhanced activity of the pulsations of the heart is also due to the fact that the pulmonary capacity being augmented, the demand for venous blood by the lungs is greater. More blood comes to the right ventricle, which causes more to flow into the left ventricle, so that the venous circulation and the arterial circulation are augmented. As to the action on the heart-muscle, I shall take that up in the next lecture, when I come to the treatment of diseases of the heart by gymnastics.

In the muscles the influence is more direct. Forcible contractions give rise, in the muscular substance, to physical and chemical phenomena which augment the nutritive exchanges, and cause the muscular bundles to become thicker and firmer. I have no need to give you in this place direct proofs of this fact. Such physiological proofs abound, and you have only to confine one limb in splints and exercise the other, to have a demonstration of the atrophy which attends the bandaged limb, and the increased development which marks the limb that is exercised.

These exercises not only promote the development of the muscles, they act also favorably on the nervous system. In fact, every co-ordinated muscular movement entails a nervous expenditure, and without going as far as DuBois-Reymond (*Revue Scientifique*, 1880), who affirms that the exercises of the body are rather exercises of the central nervous system, than muscular exercises, one may truly say that gymnastics tend to restore the equilibrium between the functions of the brain and those of the spinal cord.

Gymnastics act not only on the respiration, circulation, musculation, and innervation, they also promote secretion and excretion.

All movements which are somewhat prolonged provoke the production of sweat, which is one channel of elimination for urea and uric acid. I have seen the perspiratory secretion augment by an hour's exercise to six hundred grammes, and even in some subjects attain the figure of fifteen hundred grammes. This is, you know, a channel of excretion which is vicarious with the renal emunctory, and which we may utilize to great advantage in therapeutics.

If I were to sum up in one sentence the physiological action of gymnastics and bodily exercise, I would say that they promote and invigorate nutrition. I have just showed you that by the enhanced energy of the circulation, and the increase of the respiratory capacity, a greater quantity of venous blood comes in contact with the air, and that this energizes the phenomena of combustion. I have shown you, moreover, that by exercise the muscular interchanges are promoted.

This augmentation in the muscular and respiratory combustions entails an augmentation of heat, and in this connection we may properly refer to the careful experiments of Rouhet and of François Franck.* These experimenters have demonstrated that muscular exercises augment the central temperature, but that, owing, on the one hand, to the production of sweating, and, on the other, to the greater quantity of venous blood brought in contact with the air of respiration, and producing a veritable pulmonary sudation, equilibrium is established between the external temperature, which falls, and the temperature of the deep parts, which rises.

But this is but one aspect of the question. Last year I showed you the important rôle of the cell in nutrition. Under the influence of gymnastics, the activity of the cellular functions is enhanced and regulated, the intracellular combustions are energized, the leucomanes, those toxic alkaloids which the organic cell constantly fabricates, augment in quantity, and are more actively eliminated; and from all these circumstances it results that fatty substances and waste extractives are burned, cell repair is promoted, and equilibrium is effected between the cells of the brain and spinal cord; in a word, general nutrition is expedited.

The digestive functions do not remain indifferent to this nutritive gain, and they are

* Rouhet, "Experimental Researches on the Physiological Effects of Gymnastics and of Training," pp. 36 and 45. Paris, 1881.

beneficially influenced in two ways,—first by the contractions of the diaphragm and abdominal muscles, which invigorate the abdominal and hepatic circulation, and indirectly by the augmentation of the combustions of the economy; and it is a trite thing to say that exercise increases the appetite. Hence Chomel was right in affirming that one digests with his legs as well as with his stomach.

It must be borne in mind that to obtain this enhanced activity of digestion, it will not do to undertake violent exercise immediately after the ingestion of a hearty meal. You all remember the fact, so frequently mentioned in treatises on physiology, that when you take two dogs after a full meal, and shut up one of them in its kennel, and cause the other to engage in violent running, digestion is more advanced (other things being equal) in the dog which is kept at rest than in the one which is subjected to active exercise.

This general influence on nutrition is represented by palpable signs, and this is the case even in adult men,—augmentation of muscular force and augmentation of weight. In a table which you will find in the work of Chassagne and Dally, and which I here place before you, you see indicated the augmentation in kilogrammes noticed in the pupils of the Military School of Joinville le Pont:

	Augmentation in kilogrammes.	Percentage of pupils.
Lifting force	28.00	86
Force of flexion of the forearm on the arm	3.14	63
Force of flexion of the fingers on the palm of the hand	9.75	81
Force of the extended arm	2.41	74
Force in carrying loads	11.52	66
Force of progression or of traction	9.81	65
Force of the triceps contraction, or of ankle contraction	10.08	75

As to the augmentation of weight, it is far from being constant under the influence of gymnastic exercises. Hence among these same pupils, trained in gymnastics, thirty-four per cent. only, at the end of six months of training, had increased in weight by an average of 1.14 kilogrammes; the remaining sixty-six per cent. had either not gained at all, or had lost in weight, and this is easily explained. Gymnastic exercise, by favoring the combustion of fats, and by augmenting the organic combustions generally, by invigorating the cellular nutrition, is a powerful means for promoting emaciation, of which we avail ourselves in the treatment of obesity. Hence it is that gymnastics have the effect to make corpulent persons grow lean, and to lose in weight, while both muscular development and muscular force are augmented.

In individuals who have no accumulation of fat in the cellular tissue, corporeal exercises, on the contrary, will have the effect by augmenting these muscles to increase their weight. But to obtain these effects it will not do to carry the exercise too far, for, if practised to excess, the individual will grow lean and become feeble, and offer all the symptoms included under the name of *overstrain* (*surmenage*).

The effects of overwork have been well studied in animals, and, in particular, in horses. When you subject animals to excessive toil, you see them grow lean and feeble, despite abundant feeding, and they easily become a prey to epizootic diseases. It is the same with man, for gymnastic exercises, carried to too great a length, weaken and prostrate, and render the person an easy victim to tuberculosis.

What I say, gentlemen, has been known from remote antiquity, and the Father of medicine, while recognizing the utility of physical exercises, protests against their excess. He shows that athletes in particular stand the fatigues of war with difficulty, and fall a prey more readily than others to diseases; in a word, they make poor soldiers.

But if for the adult age gymnastics when pressed too far are hurtful, for children a reasonable amount of such exercises is in every way advantageous. In the early period of life the child is in the plastic, formative stage of its existence, and its constitution readily takes the bent which its physical education imparts. In giving the child a judicious gymnastic training you develop the skeleton and the muscular tissue, you augment the capacity of the thorax, you invigorate the circulation, you equilibrate the functions of the nervous system, you favor nutrition; in a word, you develop all that pertains to robust manhood.

Therefore there is general agreement in giving gymnastics an increasingly prominent place in the education of boys and girls. But this is a point to which our civilization has long been tending, and I have already said sufficient about its importance. I pass on now to a consideration of the applications of gymnastics to the treatment of diseases, a subject which I shall take up in the next lecture.

CRITICAL OBSERVATIONS AND EXPERIMENTAL STUDIES ON THE INFLUENCE OF PHARMACOLOGICAL AGENTS ON PERIPHERAL VESSELS.

By Prof. R. Kobert.*

PART II.

In the first part of this work (Therapeutic Gazette, January 15 and February 15) I have given a review of all the investigations previously made by the authors of other countries upon the circulation in the organs of warm-blooded animals, from the standpoint of its bearing upon the study of pharmacology.

In these papers I have cited Alexander Schmidt, of Dorpat, as the first writer who had made and reported experiments upon organs removed from the body with various drugs. Historically, however, this is not correct, for Friedrich Bidder has informed me that in 1862, five years before Schmidt, he had made such experiments, assisted by his son, Ernst Bidder, upon kidneys removed from the body.†

Similar experiments were made in 1849 by Loebell.‡ After this historic digression I will commence my present paper.

In my paper in the Therapeutic Gazette of February 15, 1887, p. 90, I said that I would speak later of the drugs of the digitalis group, which possess other properties than those already recognized.

The great importance which the digitalis group possess in therapeutics has led me to review all my previous experiments with new apparatus before studying other allied substances, and I have been assisted by Dr. Hermann Thomson, assistant in the clinic of gynæcology, who has reported his experiments upon the working of digitalis upon the vessels, and also the influence of drugs which I had not previously studied, in his inaugural dissertation,§ and also in the Russian journal *Wratsch.* I append on page 371 a table of substances, which *in all organs examined and under all circumstances cause blood-vessels to contract.*

This table shows that barium chloride has a marked effect in contracting the blood-vessels. In contrast to all the substances of the digitalis groups this agent produces no effect upon the heart, nor does it further the development of bacteria and also decomposition products when kept for some time in watery solution. I can, therefore, recommend barium chloride as an agent to produce the effect of digitalis locally upon a limb, for example, where dilated blood-vessels exist. The best application for dilated cutaneous veins (for example, on the legs) is the following:

℞ Barii chloridi, gr. xxx;
Dissolve in distilled water, and mix thoroughly
Lanolini, ʒiii¼;
Olei amygdalarum dulc., ♏lxxv. M.
F. Unguentum.

Sig.—Three times daily, with friction, whenever dilated blue veins shine through the skin.

Barium chloride can be also used in the place of substances of the digitalis group in cases of heart-disease where help is demanded so soon that remedies given internally are not available.‖ We can then use

℞ Sol. barii chloridi, 1 to 100.

Sig.—⅓ to ½ the contents of a hypodermic syringe should be given at a dose for heart-lesions with deficient compensation.

We know that substances of the digitalis group have an influence upon the gastro-intestinal tract to such an extent that vomiting and purging may be excited by these drugs, not only when given by the mouth, but also when given subcutaneously. Barium chloride and all the soluble salts of barium have an effect upon the intestine, in that they are excreted through the intestines after being taken by the mouth, and in large doses may cause diarrhœa. It is not yet known that the digitalis group are excreted through the intestines, but the analogy with the barium salts suggests such a process. For the physician the fact of practical importance remains that when administering barium chloride, if diarrhœa supervenes, the drug should be discontinued.

Barium chloride has an influence, not only upon the vessels and intestinal tract, but also upon the heart, analogous to the effect of digitalin. Experiments upon frogs show that after injection of a small quantity of barium salt

* Chief of the Pharmacological Laboratory at Dorpat, Russia.

† Ernst Bidder, "Contribution to the Study of the Functions of the Kidney," *Inaugural Dissertation*, Dorpat, 1862. With a lithographic illustration.

‡ Loebell, "De Conditionibes, Quietus Secretiones in Glandulis Perficientur," Marburg, 1849.

§ "Upon the Influence upon Peripheral Vessels of Pharmacological Agents," *Inaug. Dissert.*, Dorpat, 1887, 106 pages; with a lithographic plate describing the apparatus used.

‖ At least until we possess some other substance of the digitalis group suitable for subcutaneous injection, and better in effect than those now in our hands. *As yet we have not one such substance.*

TABLE I.

Table of those Substances of the Digitalin Group which Contract the Vessels of all Organs.

I. No. of experiment.	II. Kind of animal.	III. Organ.	IV. Pharmacological agent.	V. Per 1000 contents of blood in IV.	VI. Duration of action.	VII. Changes of velocity of outflow in per cent.	VIII. Transfused absolute quantity of IV. in grammes.	IX. Special remarks.
1	Ox.	Kidney.	Chloride of barium.	0.40	1	— 11	40	Organs and blood used 18 hours after death of animal, kept on ice. After the contraction, in the next minute, a well-marked compensatory widening followed.
2	Ox.	Kidney.	Chloride of barium.	2.00	1	— 20	190	
3	Ox.	Kidney.	Chloride of barium.	2.00	1	— 10	200	
4	Sheep.	Spleen.	Chloride of barium.	2.00	3	— 8	180	
5	Frog.	The whole body.	Chloride of barium.	0.50	5	— 20	15	Central nervous system preserved.
6	Frog.	The whole body.	Chloride of barium.	0.50	0	— 45	5	
7	Frog.	The whole body.	Chloride of barium.	0.50	2	— 82	2	
8	Sheep.	Kidney.	Chloride of strontium.	2.00	2	— 33	100	
9	Sheep.	Kidney.	Chloride of strontium.	1.00	2	— 21	90	
10	Sheep.	Spleen.	Chloride of strontium.	1.00	1	— 44	50	
11	Frog.	The whole body.	Chloride of strontium.	2.50	4	— 4	12	Central nervous system destroyed.
12	Frog.	The whole body.	Chloride of strontium.	0.50	7	— 9	25	Central nervous system preserved.
13	Frog.	The whole body.	Chloride of strontium.	2.00	6	— 63	2	
14	Frog.	The whole body.	Chloride of strontium.	10.00	3	— 50	60	
15	Frog.	The whole body.	Chloride of strontium.	2.50	8	— 18	13	
16	Hog.	Kidney.	Veratrine hydrochlorate.	0.02	4	— 44	1	
17	Frog.	The whole body.	Veratrine hydrochlorate.	0.01	8	— 16	0.8	
18	Frog.	The whole body.	Veratrine hydrochlorate.	0.02	6	— 50	0.1	Central nervous system preserved.
19	Frog.	The whole body.	Veratrine hydrochlorate.	0.05	4	— 75	0.7	
20	Frog.	The whole body.	Veratrine hydrochlorate.	0.02	3	— 10	0.6	The brain only destroyed.
21	Frog.	The whole body.	Salicylate of physostigmine.	0.04	3	— 5	1.4	Central nervous system preserved.
22	Frog.	The whole body.	Salicylate of physostigmine.	0.10	3	— 12	3.0	
23	Frog.	The whole body.	Salicylate of physostigmine.	0.10	2	— 5	2.0	
24	Frog.	The whole body.	.....	0.15	5	— 34	4.5	
25	Frog.	The whole body.	.....	0.15	3	— 34	1.5	After-effect 7 minutes; central nervous system destroyed.
26	Frog.	The whole body.	.....	0.08	3	— 38	1.6	Central nervous system destroyed.
27	Sheep.	Kidney.	Antiarine.	Very little.	2	— 12	.....	
28	Sheep.	Kidney.	Antiarine.	Very little.	1	— 40	.....	
29	Frog.	The whole body.	Antiarine.	Very little.	2	— 13	.....	Central nervous system preserved.
30	Frog.	The whole body.	Antiarine.	Very little.	2	— 13	.....	
31	Frog.	The whole body.	Antiarine.	Very little.	3	— 19	.....	
32	Frog.	The whole body.	Antiarine.	Very little.	4	— 17	.....	After-effect 8 minutes.
33	Frog.	The whole body.	Antiarine.	Very little.	2	— 10	.....	Central nervous system destroyed.
34	Ox.	Foot.	Sabadilline.	0.08	6	— 21	3.0	
35	Ox.	Foot.	Sabadilline.	0.10	4	— 14	2.0	After-effect 9 minutes.
36	Sheep.	Kidney.	Sabadilline.	0.10	4	— 32	2.0	
37	Sheep.	Kidney.	Sabadilline.	0.03	2	— 24	0.3	
38	Frog.	The whole body.	Sabadilline.	0.05	3	— 3	1.7	Central nervous system destroyed.
39	Frog.	The whole body.	Sabadilline.	0.10	3	— 14	3.0	
40	Frog.	The whole body.	Sabadilline.	0.10	3	— 16	2.4	Central nervous system preserved.
41	Sheep.	Kidney.	Helleboreïne.	0.05	4	— 35	3.0	
42	Sheep.	Spleen.	Helleboreïne.	0.06	3	— 32	4.0	
43	Frog.	The whole body.	Helleboreïne.	0.40	3	— 15	10.0	Central nervous system preserved.
44	Frog.	The whole body.	Helleboreïne.	0.50	2	— 34	5.2	After-effect 11 minutes; central nervous system preserved.
45	Frog.	The whole body.	Helleboreïne.	0.50	2	— 19	5.0	Central nervous system preserved.
46	Frog.	The whole body.	Helleboreïne.	0.40	3	— 11	16.0	Central nervous system destroyed.
47	Frog.	The whole body.	Helleboreïne.	0.50	3	— 13	16.8	
48	Ox.	Foot.	Soillaïne.	0.83	1	— 68	1.2	
49	Sheep.	Kidney.	Soillaïne.	0.06	1	— 27	1.5	Central nervous system preserved.
50	Frog.	The whole body.	Soillaïne.	0.10	3	— 11	0.6	
51	Frog.	The whole body.	Soillaïne.	0.20	3	— 11	0.6	
52	Frog.	The whole body.	Soillaïne.	0.20	2	— 12	1.2	
53	Frog.	The whole body.	Soillaïne.	0.10	5	— 39	2.7	
54	Frog.	The whole body.	Soillaïne.	0.08	4	— 46	9.2	Central nervous system destroyed.
55	Frog.	The whole body.	Soillaïne.	0.30	6	— 9	5.4	
56	Frog.	The whole body.	Soillaïne.	0.30	2	— 25	0.9	
57	Ox.	Foot.	Adonidine.	0.05	4	— 12	1.7	
58	Ox.	Foot.	Adonidine.	0.07	4	— 13	1.6	
59	Ox.	Foot.	Adonidine.	0.17	6	— 20	9.0	
60	Ox.	Foot.	Adonidine.	0.33	4	— 28	10.0	
61	Sheep.	Foot.	Adonidine.	0.05	3	— 38	0.7	After-effect 7 minutes.
62	Sheep.	Foot.	Adonidine.	0.07	4	— 56	2.0	After-effect 14 minutes.
63	Frog.	The whole body.	Adonidine.	0.10	2	— 17	1.5	Central nervous system preserved.
64	Frog.	The whole body.	Adonidine.	0.05	3	— 10	1.5	Central nervous system destroyed.
65	Frog.	The whole body.	Adonidine.	0.10	1	— 17	1.7	
66	Ox.	Foot.	Convallamarine.	0.02	4	— 14	2.0	
67	Ox.	Foot.	Convallamarine.	0.10	4	— 25	8.0	
68	Ox.	Foot.	Convallamarine.	0.05	2	— 35	4.0	After-effect 7 minutes.
69	Ox.	Foot.	Convallamarine.	0.10	2	— 25	3.0	After-effect 11 minutes.
70	Frog.	The whole body.	Convallamarine.	0.20	3	— 9	6.6	Central nervous system destroyed.
71	Frog.	The whole body.	Convallamarine.	0.20	4	0	8.0	
72	Frog.	The whole body.	Convallamarine.	0.20	4	0	6.0	
73	Frog.	The whole body.	Convallamarine.	0.20	4	— 17	4.4	Central nervous system preserved.
74	Frog.	The whole body.	Convallamarine.	0.20	2	— 10	2.0	
75	Frog.	The whole body.	Convallamarine.	0.04	3	— 6	1.0	
76	Frog.	The whole body.	Convallamarine.	0.12	3	— 10	1.8	
77	Ox.	Foot.	Erythrophleïne.	0.02	2	— 55	0.8	After-effect 16 minutes.
78	Ox.	Kidney.	Erythrophleïne.	0.04	3	— 23	1.5	
79	Frog.	The whole body.	Erythrophleïne.	0.50	3	— 10	13.5	Central nervous system destroyed.
80	Frog.	The whole body.	Erythrophleïne.	0.20	3	— 5	4.8	
81	Frog.	The whole body.	Erythrophleïne.	0.20	1	— 20	0.8	Central nervous system preserved.
82	Frog.	The whole body.	Erythrophleïne.	0.20	3	— 6	9.2	
83	Frog.	The whole body.	Strophanthine.	2.10	3	— 12	6.0	
84	Frog.	The whole body.	Strophanthine.	2.10	2	— 17	5.5	
85	Ox.	Foot.	Strophanthine.	1.40	2	— 25	7.0	
86	Ox.	Foot.	Strophanthine.	1.40	1	— 12	1.0	After-effect 7 minutes.
87	Ox.	Kidney.	Strophanthine.	5.20	3	— 33	4.0	After-effect 5 minutes.
88	Ox.	Kidney.	Strophanthine.	1.40	2	— 20	1.0	
89	Ox.	Kidney.	Strophanthine.	1.40	2	— 25	3.0	After-effect 13 minutes.

the heart ceases to beat in systole precisely as after the use of digitalis. Striped muscle furnishes, however, an excellent differential point between barium salts and digitalis. All drugs of the digitalis group, when given in small medicinal doses, produce a lessening of the contractile power of muscle, so that patients who are taking scilla, convallaria, adonis, digitalis, strophanthus, etc., after a short time feel their muscular power greatly lessened in spite of improved cardiac rhythm, lessened dropsy, and stronger pulse. Under the influence of barium salts, on the contrary, the extent and degree of muscular contraction (independently of nervous influence) are increased, as Brunton* has found, and I bear added witness to the fact.

Barium in this particular resembles veratrine, which has a similar effect, but in much greater degree, but is so poisonous that we cannot use it as a therapeutic agent.

It was, however, of interest to Thomson and me to know that strontium exercised a like contractile force upon the blood-vessels, and the table shows its effects to be analogous to that of barium.

The table shows also the vaso-motor effect of physostigmine and veratrine, as was indicated in my former experiments; this is also true of antiarine and sabadilline.

Of the substitutes for digitalis in practical use I have examined helleborine, soillaine, convallamarine, erythrophleine, oleandrine, and apocynine, and found them possessed of power to contract blood-vessels. We have also found the same power in helleboreine, soillaine, convallamarine, and erythrophleine, and we include, as of similar effect, adonidine and strophanthine. All of these drugs have the effect of digitalin of Schmiedeberg,—*i.e.*, they narrow the blood-vessels of all organs which were examined in the course of my investigations; also the kidneys. To explain what is meant by "digitalin of Schmiedeberg," I will say that under this name I understand that body which my honored teacher, O. Schmiedeberg, has described in the third volume of his *Archives*, page 27, and which contains sixty per cent. oxygen and eight per cent. nitrogen. It is absolutely insoluble in water, and is contained in the plants of the digitalis family in very small amounts, and is therefore very expensive. The greater portion of the proportions of digitalis in the market (French, English, and German) contain a very small amount or none at all. This point would not be mentioned if Lafon, a French author, in the *Bullet. de l'Académie de Médecine de Paris*, 1886, No. 12, p. 528, had not published an incorrect explanation regarding Schmiedeberg's researches, although he had been in the institute of the professor. Against his errors Merck, of Darmstadt, published a protest, which was given in the THERAPEUTIC GAZETTE, 1886, p. 768. The statements of Merck and Schmiedeberg agree exactly.

In marked contrast to all the substances previouslv described are two others, digitoxin† and digitalein,‡ of which I have specimens from Schmiedeberg himself, and which exercise a dilating, and not contracting, power upon the vessels of the kidneys.

* *Transactions of the Royal Society*, i., 1884, p. 222: "Action of Salts of the Alkaline Group on Muscle and Nerve."

† Described by Schmiedeberg in Bd. iii. p. 35, of his Archives (Leipzig, Vogel, 1875).

‡ Described as above.

TABLE II.

Influence of Digitoxin and Digitalein on the Spleen, Foot, and whole Extremity.

I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.
No. of experiment.	Kind of animal.	Organ.	Pharmacological agent.	Per 1000 contents of blood in IV.	Duration of action.	Changes of velocity of outflow in per cent.	Transfused absolute quantity of IV. in grammes.	Special remarks.
90	Dog.	Whole extremity.	Digitoxin.	0.010	18	— 64	3.0	
91	Sheep.	Spleen.	Digitoxin.	0.008	2	— 15	0.9	
92	Ox.	Foot.	Digitoxin.	0.016	3	— 45	0.4	
93	Ox.	Foot.	Digitoxin.	0.016	3	— 42	0.5	After-effect 10 minutes.
94	Ox.	Foot.	Digitoxin.	0.040	2	— 36	0.7	After-effect 10 minutes.
95	Ox.	Foot.	Digitoxin.	0.006	2	— 30	0.3	After-effect 8 minutes.
96	Ox.	Foot.	Digitoxin.	0.008	2	— 40	0.13	After-effect 13 minutes.
97	Sheep.	Spleen.	Digitalein.	0.016	3	— 72	0.1	After-effect 11 minutes.
98	Sheep.	Spleen.	Digitalein.	0.012	3	— 9	0.4	
99	Ox.	Foot.	Digitalein.	0.083	10	— 23	0.6	
100	Ox.	Foot.	Digitalein.	0.052	3	— 10	1.5	
101	Ox.	Foot.	Digitalein.	0.050	2	— 40	0.9	After-effect 12 minutes.
102	Ox.	Foot.	Digitalein.	0.830	3	— 0	3.0	
103	Ox.	Foot.	Digitalein.	0.830	4	— 14	3.0	

TABLE III.

Influence of Digitoxin and Digitalein on the Kidneys.

I. No. of experiment.	II. Kind of animal.	III. Organ.	IV. Pharmacological agent.	V. Per 1000 contents of blood in IV.	VI. Duration of action.	VII. Changes of velocity of outflow in per cent.	VIII. Transfused absolute quantity of IV. in grammes.	IX. Special remarks.
104	Hog.	Kidney.	Digitoxin.	0.030	3	+ 177	2.2	
105	Hog.	Kidney.	Digitoxin.	0.004	5	+ 5	0.04	
106	Hog.	Kidney.	Digitoxin.	0.020	5	+ 9	1.84	
107	Sheep.	Kidney.	Digitoxin.	0.033	2	+ 75	0.4	
108	Ox.	Kidney.	Digitoxin.	0.016	7	+ 15	1.0	Afterwards a compensatory contraction of the vessels lasting 7 minutes.
109	Ox.	Kidney.	Digitoxin.	0.032	4	+ 20	6.0	A similar contraction of 8 minutes' length.
110	Sheep.	Kidney.	Digitalein.	0.016	2	+ 12	1.1	
111	Sheep.	Kidney.	Digitalein.	0.010	4	+ 14	1.2	
112	Sheep.	Kidney.	Digitalein.	0.016	4	+ 27	1.6	
113	Sheep.	Kidney.	Digitalein.	0.016	3	+ 28	2.0	
114	Sheep.	Kidney.	Digitalein.	0.009	3	+ 17	1.3	
115	Hog.	Kidney.	Digitalein.	0.020	2	+ 66	1.1	
116	Hog.	Kidney.	Digitalein.	0.020	2	+ 88	1.9	
117	Dog.	Kidney.	Digitalein.	0.333	4	+ 24	20.0	Later compensatory contraction.
118	Dog.	Kidney.	.....	0.333	2	+ 50	10.0	After poisoning a compensatory contraction of —20 per cent.
119	Dog.	Kidney.	Digitalein.	0.333	4	+ 50	10.0	Very pronounced compensatory contraction.
120	Ox.	Kidney.	Digitalein.	0.166	7	+ 30	18.0	Later compensatory contraction.
121	Ox.	Kidney.	Digitalein.	0.083	3	+ 13	11.0	Later a brief compensatory contraction.
122	Frog.	The whole body.	Digitalein.	0.100	2	+ 25	2.8	} Central nervous system preserved.
123	Frog.	The whole body.	Digitalein.	0.040	3	+ 5	1.0	
124	Frog.	The whole body.	Digitalein.	0.040	4	+ 16	0.5	

From a comparison of these two tables it is evident that *the effect of digitoxin and digitalein differs from that of the others of the digitalis group in that in the doses in which we have reason to expect by analogy that these drugs would contract the vessels of the kidneys they not only do not contract but dilate them ;** while, like digitalin, helleboreine, adonidine, convallamarine, etc., in all other organs of the body they contract the blood-vessels.

Thomas Fraser has observed that strophanthine has not this power of causing contraction. I am not prepared to admit this ; more observations must be made.

I believe that strophanthine, which I have myself prepared from genuine seeds, has an effect identical with digitalin, helleboreine, barium chloride, etc.,—namely, to contract the blood-vessels of all the organs of the body.

If the question be raised what significance in therapeutics the remarkable effects of these two† substances possess, we must reply that in cases where a prolonged and energetic secretion by the kidneys is necessary in a patient suffering from hydrops, the result of impeded circulation, the contraction of all the blood-vessels of the periphery is of the greatest practical importance, so that the peripheral blood-channels may be narrowed and the rapidity of the circulation be enhanced through the increased functional capability of the heart (which has been clearly demonstrated by F. Williams,‡ of Boston), and as a result of the increased rapidity and activity of the circulation, both in the body at large and in the kidneys, the secretion of urine will be increased.

It is evident, however, that when in the kidney itself the blood-vessels are not only not contracted but slightly dilated, the secretion of urine will be still more abundant, inasmuch as the quantity of urine produced depends not only upon the rapidity of the renal circulation, but also upon the volume of blood present in the kidneys. The greater the volume of blood present, at least in the glomeruli and convoluted tubules, the greater the amount of urine which can be secreted. It is therefore evident that by means of the agent which produces contraction of the blood-vessels of the entire body the secretion of urine can be favorably influenced, until by

* After the use of very large doses it happens, as the tables show, that contraction follows the first effect, but this proves the more plainly that the previous dilatation was not an accident, but a result of the drug.

† Two other substances of this group, digitonin and digitin, I found to be without influence on the blood-vessels.

‡ *Schmiedeberg's Archiv*, Bd. xiii. p. 1.

the removal of blood from the periphery the local anæmia of the kidneys can be remedied. While the action of the drug increases, the secretion of urine will lessen rather than continue to increase.

By the use of digitalis, in which, in addition to a substance which contracts all the vessels (digitalin), there are two others in considerable quantities which dilate the vessels (digitoxin and digitalein), we shall produce in a patient a continuous diuresis; for too great anæmia of the kidneys to permit of secretion can never occur. For these reasons are the leaves of digitalis purpurea an agent which through *none* of the many other vaso-motor remedies can be supplanted, for we are as yet ignorant of other remedies which act like digitoxin and digitalein. The importance of my statement, that digitalis medication has no substitute, every practitioner will admit. The substitution for digitalis of adonis, convallaria, etc., is not because digitalis does not affect the heart properly, but because digitalis often causes vomiting and purging in certain patients in whom the other drugs, adonis, convallaria, strophanthus, etc., do not produce such results. I have recommended barium chloride, not because it acts more powerfully than digitalis, but because it is cheap, is easily and persistently soluble, and produces no irritation when given subcutaneously.

What form of digitalis shall be employed? Most commonly preferred is the infusion. This naturally contains only those substances soluble in water. Of the three important active principles, as digitalein, a drug which produces dilatation of the vessels of the kidneys, is soluble in alcohol, it is contained in the tincture and alcoholic extract. The other constituents, digitoxin and digitalin, are also soluble in alcohol; in alcoholic preparations, as well as in the leaves themselves, we obtain the three important active principles.

In fluid extracts digitoxin is precipitated as an insoluble powder. Acetum digitalis (vinegar of digitalis) approaches the infusion most closely in regard to its contents. It is very desirable that fresh, well-dried leaves be used. When the leaves are imperfectly dried a species of fermentation may occur which may decompose the three essential components of the drug, for digitalin and digitalein are, like all glucosides, decomposable through foreign matter and fermentation. Digitoxin is, however, not a glucoside, but decomposes as easily and under the same circumstances as the others. The result of the decomposition of digitalis is not a substance producing the desired effects upon the heart, but a resin, digitaliresin (from digitalein and digitalin) and toxiresin (from digitoxin). The effect of these bodies is a violent irritation of the convulsive centres of the brain; severe convulsions may also occur, as in poisoning with picrotoxine or cicuta verosa. Whenever the usual effects of digitalis are wanting, or instead cramps occur, we are safe in thinking that the preparation used was a poor one. The decomposition of digitalis may occur not only in the leaves, but also in infusions and solutions of digitalin and digitalein. As Tardieu* says, "The pure digitalin when suspended in water or dissolved undergoes decomposition in a short time, whereby the bitter taste is altered and, as an indication of a radical change in the constitution of the drug, gases form." Among my patients I have very often seen decomposition in preparations of digitalis which had stood two days in a room. This happens from the mixing of digitalis tincture with syrup or watery solution. The practice prevalent in America of not preparing the drug from the leaves when desired, but of using a concentrated infusion, explains the frequent disappointment in its use.

Post-mortem examinations in cases of poisoning by digitalis are reported, but in one case, observed by Cloetta,† was the distribution of the blood the one important phenomenon observed, and the vessels of the kidneys were found not only not contracted, but dilated. Such a post-mortem appearance is quite unintelligible, save in the light of our experiments on digitalein and digitoxin, for which it furnishes an excellent illustration.

ON LOCAL APPLICATIONS TO THE PROSTATE GLAND;

PARTICULARLY IN REFERENCE TO IMPOTENCY AND URINARY TROUBLES ARISING FROM DISEASE OF THAT ORGAN.

By T. Williams, M.D., Milwaukee, Wis.

THERE are certain diseases of the prostate gland invested with a peculiar interest to all men, laymen as well as professional, owing to the fact that they are the frequent and often unsuspected source of

* Ambrose Tardieu, "Die Vergiftungen Autorisirte." German edition. Erlangen, 1868. Enke, p. 361.

† Cloetta, "Lehrbuch der Artzneimittellehre," 1883, II. Aufl., p. 217.

urinary troubles, as well as partial or complete sexual impotence in the male. The results of Sir Henry Thompson's researches on this subject, as given in his "Clinical Lectures on Diseases of the Urinary Organs," were that *one-third* of all men over fifty-five have some enlargement of the prostate. Enlargement of the prostate, in fact, is a disease almost peculiar to middle and advanced life, between fifty and sixty; but chronic irritability and inflammation are much more frequently met with between the ages of twenty-five and fifty.

The points of special clinical importance in reference to the anatomy of the prostate are, that when the finger is introduced into the rectum the healthy prostate is felt in the median line as a body about one and one-half inches long, and as broad as it is long, about one and one-half inches from the anus. The vesiculæ seminales lie beyond it, and the vasa efferentia, which convey the seminal fluid, open into that part of the urethra surrounded by the prostate. In all chronic urinary troubles the practitioner should not fail to make a digital examination of the prostate gland, as it will often yield information without which he could not successfully treat the affection.

The object of this paper being to call attention to the great value of local applications to the prostate, it is not proposed to deal fully with its various diseases. I shall, therefore, speak only of those to which this method of treatment is particularly applicable.

I wish to remark in the outset that the *remote* origin of more than one-half the cases of prostatic disease treated by me has been a previous neglected or improperly treated gonorrhœa. The patient may have had the gonorrhœa twenty or thirty years before that laid the foundation, or planted the predisposing cause, of the existing disease. In fact, I believe this also to be the most prolific source of generative weakness in middle life, as the urethra never seems to regain its virgin condition after a case of prolonged gonorrhœa.

HYPERTROPHY OF THE PROSTATE GLAND.

Chronic enlargement of the prostate may be a simple increase in the size of the gland from previous congestions due to frequent or long-continued sexual excitement, or previous inflammation; it may arise from scrofulous or tubercular deposits, from calcareous deposits in its substance, and finally from a new growth caused by an increased flow of blood to the parts. Each of these forms of enlargement is denoted by certain characteristics which usually enable us to diagnosticate them accurately. The degree of trouble arising from enlarged prostate depends very much upon its character. Thus, the lateral lobes may be greatly enlarged without causing much inconvenience for a long time; but if the middle lobe, forming the floor of the prostatic portion of the urethra, or that portion next to the bladder, is only slightly enlarged, difficulty in micturition is sure to follow. Thus, a simple hypertrophy, which usually affects the lateral lobes, may reach enormous proportions without giving rise to any particular symptoms; while, on the other hand, an enlargement of the middle lobe, which can scarcely be detected by the finger, may cause the most distressing trouble.

The symptoms which indicate enlargement are: difficulty in emptying the bladder, the urine escaping in driblets; there is a frequent desire to pass water, especially at nights and mornings; the character of the urine is usually unchanged, and there may be slight pain before passing it, but usually none afterwards. These are the early or premonitory signs of hypertrophy, and unless relieved increase in severity as the enlargement progresses. The patient reaches a stage where he finds it difficult to hold the water; the desire to pass it is imperative, and must be immediately attended to. This condition is produced by over-distention of the bladder, in which the urine accumulates on account of that viscus not being entirely emptied. From the same cause cystitis, or inflammation of the bladder, is liable to occur, and not only the bladder itself, but also the ureters, which convey the urine from the kidneys to the bladder, become dilated; and this in turn produces inflammation of the kidneys, winding up with Bright's disease.

Those suffering from chronic hypertrophy are liable to occasional attacks of *congestion of the prostate*. Congestion usually comes on suddenly, as a result of some indiscretion in diet or drinking, exposure to cold, or other apparently trivial cause. There is complete retention of urine, accompanied by bloody urine, an increased temperature, quick pulse, and more or less pain and uneasiness in the region of the bladder. If the urine is not speedily evacuated through the catheter, putrefaction ensues, the tongue becomes dry and covered with a brown coat, the pulse becomes faster and weaker, and the patient sinks into a typhoid condition, which may end fatally. Old men are more liable to these

attacks than young men. It is of the utmost importance to prevent putrefaction of the urine, by antiseptic treatment and catheterization, as this is the most frequent cause of death in such cases.

In the treatment of hypertrophy of the prostate, as Dr. Godlee says, "it is only necessary here to give two words of warning. First, that most of the evils resulting from this condition depend upon the fact *that the bladder is never emptied;* it is essential, therefore, that the patient's powers in this respect should be ascertained without delay by catheterization, and if it be discovered that a certain amount of residual urine remains, he should be taught to pass the instrument himself, and directed to do so at least once a day. Secondly, cystitis has often been caused by setting up putrefaction of the urine by a catheter not surgically clean; the simple precaution of lubricating it with carbolized oil prevents with certainty this catastrophe."

The general treatment, including the proper regulation of the patient's diet and habits, will suggest itself to every well-informed physician, and would be foreign to the scope of this paper. My object is to point out the peculiar advantages of *local applications to the prostate* with a view of effecting a radical cure. These advantages can scarcely be overestimated, as by the judicious employment of the proper remedies in this way there is but little question that Bright's disease and other complications which cut short many valuable lives may be averted. It is a well-known fact that the late Napoleon III. fell a victim to prostatic disease, originating many years previously in imprudent excesses of various kinds. Although (as in his case) the immediate cause of death may be some disease of the bladder, or a stone necessitating cutting, or, as in others, kidney-disease, these affections may be traced back to what was at first an apparently insignificant urinary trouble, arising from enlargement of the middle lobe of the prostate, which would have yielded readily to the proper local applications made directly to the prostate urethra.

The nature of these applications and the mode of making them will be referred to in connection with the treatment of chronic inflammation of the prostate. In all cases the local treatment should be combined and used in conjunction with such general treatment as the individual case may seem to require. I will only remark here that great relief and benefit will be experienced from the use of suppositories, properly medicated, and used per rectum, as the suppository, when introduced, lies adjacent to the prostate gland, and the iodinized or other alterative ingredients with which it is medicated thus readily reach the gland, and supplement the applications made through the urethra. I have obtained excellent results from rectal suppositories of cocoa butter medicated with potas. iod., belladonna, iodoform, and hydrarg. pernit., in proper proportions, one being introduced every night at bedtime, in connection with the local applications.

CHRONIC PROSTATITIS AND ITS VARIOUS COMPLICATIONS.

Chronic Prostatitis, or chronic inflammation of the prostate gland, is one of the most frequent causes of urinary and sexual trouble met with in men between the ages of twenty-five and fifty. Its symptoms resemble those of stone in the bladder so closely that the busy or inattentive practitioner, who has paid no especial attention to the subject, is very liable to mistake the one for the other. These symptoms are: a frequent desire to urinate, with a feeling of weight and heat in the perineum, and a pain extending the whole length of the passage to the tip of the penis.

At times a few drops of blood will follow the water, and generally the patient suffers from frequent nocturnal emissions. The urine is cloudy, and deposits a muco-purulent mass after standing awhile. A rectal examination shows the prostate tender to the touch, and more or less enlarged. It is frequently met with in young and middle-aged men, as a sequel of a prolonged gonorrhœa which has involved the prostatic portion of the urethra. It is not an affection that yields very readily to any method of treatment, and in many cases which have come under my care it had gradually subsided into a mild but persistent chronic form, in which but little enlargement or tenderness of the prostate remained, but in which the gland had taken on a state of hyperæsthesia, and was engorged and irritable. In this condition there is always more or less complaint in regard to the urine, which feels hot, with a slight smarting or stinging sensation after passing; there is often a feeling as if the bladder was not entirely evacuated, which is true, as a very slight enlargement of the floor or middle portion of the gland, as previously remarked, interferes with the complete emptying of the bladder, and causes the last drops to dribble away after the stream of urine has ceased. This symptom is one

which should not be neglected by the practitioner; although it does not indicate that degree of enlargement which causes retention of urine in middle-aged and old men, it is the commencement of chronic hypertrophy, and will eventually lead to it unless relieved.

A still more frequent symptom of hyperæsthesia of the prostate is the oozing out of a thin, transparent discharge, which is increased by any sexual excitement. This discharge, mostly composed of prostatic mucus, is not only very annoying but often alarms the patient, who mistakes it for semen. Seminal fluid, it is true, may be mixed with it, and often is, when the individual has experienced prolonged sexual excitement, or gone to any excess of this kind; but it is a mistake to suppose that the entire discharge is spermatic. The form of excitement referred to above, more especially if it has been unattended by gratification, is, according to my own observations, one of the principal causes of chronic hyperæsthesia of the prostate. We can readily understand how this can be when we consider that always during erotic excitement the prostate gland becomes congested with blood; the copious plexus of veins which surround it communicate freely with those of the vesiculæ seminales, penis, and testicles, and connect not only with the systemic, but also with the portal circulation. In fact, in those who give way to erotic ideas, the prostate is kept congested, although there may be no erection of the penis. The symptoms referred to are always aggravated by exercise, and in cases following chronic gonorrhœa the discharge assumes a gleety character; only a drop may be detected in the morning, but the quantity may be so increased after any excess as to resemble a regular case of gonorrhœa.

In young men, especially those of nervous and excitable temperaments, the most alarming of these symptoms is true spermatorrhœa, with frequent nocturnal emissions and seminal losses in the urine and at stool. In many cases which have come under my treatment these debilitating losses occurred nightly, and sometimes even two and three times during the night, in consequence of the reflex action of the prostatic irritation upon the vesiculæ seminales. So great does the dread of these repeated emissions become that young men have told me that they actually felt reluctant to go to bed. Neither the antaphrodisiacs nor the nerve-tonics seem to arrest or materially modify spermatorrhœa caused by chronic inflammation of the prostate. Every practitioner knows from repeated failures how unsatisfactory all the usual modes of treatment are in these cases. Many, indeed, can hardly realize that the trouble is as serious as the patient's sufferings would indicate, and are inclined to attribute much of it to undue anxiety and worry on his part.

TREATMENT OF DISEASES OF THE PROSTATE BY LOCAL APPLICATIONS.

In the treatment of diseases of the prostate gland, I have obtained the most satisfactory results by the local application of medicaments directly to the prostatic portion of the urethra. I am inclined to believe that the astonishing and almost incredible results claimed by M. Lallemande for the *porte caustique* in spermatorrhœa and in impotence were due more to the direct antiphlogistic action exerted upon the prostate than to any special effects of the cautery upon the spermatic ducts. Practical experience has demonstrated that the use of escharotics for this purpose should be discouraged on account of their liability to leave hardened cicatrices, which interfere with the normal functions of the organs. If something of this character is indicated in the case, it is much less objectionable to employ the hydrarg. pernit. in the form of an ointment. Of the great number of cases, however, that have been under my care, very few required caustic applications. In the greater number I have found alterative and sedative applications, such as hydrarg. bichlor., iodoform, belladonna, ergotin, and cocaine muriat., meet every indication. It would be impossible, however, to lay down any strict inflexible formula for any therapeutic agent or combination that could be used indiscriminately. Nearly every case of prostatic disease, whatever its character may be, is "a law unto itself," and the particular therapeutic agent or combination suited to it must be governed by the pathological condition of the gland as developed by digital examination. But whatever remedy is indicated, it should always be applied in the form of an ointment, as comminution renders absorption easier.

In my own practice I have for a great many years applied ointments in this way with the most gratifying results. I employ the *porte caustique* of Lallemande, charging the cup of the projecting part with the particular ointment decided on for the case, instead of the silver nitrate. Passing the canula down the passage to the prostatic portion of the urethra, I project the cup containing the ointment, and allow it to remain usually about five min-

utes, turning it around occasionally during that time. I then withdraw the instrument, and the patient goes about his business, as the operation causes no suffering, and only a slight smarting, which passes off in a few minutes. I repeat these operations about once a week, sometimes twice, and it is seldom necessary to continue them longer than from six to twelve weeks. The effect is not only gratifying, but immediate. Patient and physician are not discouraged by waiting too long for tangible results. I have often had patients apply for treatment who had been under the care of physicians of unquestionable skill for months without appreciable benefit. In some of these cases nocturnal emissions occurred five or six times a week, and even oftener; in others almost complete impotency existed, the intromittent organ seeming as if paralyzed; in nearly all there was more or less trouble of one kind or another with the urine. Yet frequently a single application to the prostate has made a marked change, reducing the frequency of the emissions from four to six a week to once, increasing the tone of the parts, increasing erectile vigor, or materially lessening the urinary trouble, as the case might be.

There is one point in this connection to which I wish to call especial attention. The subcutaneous injection of ergot at the root of the penis for restoring erectile power, as recommended by Bartholow, is seldom practicable, and nearly always renders the part sore. The application of this remedy to the prostate, as I have described, is not only more effectual in cases of impotency on account of absence of erection, but attended by none of the objections to its use as a subcutaneous injection. I have frequently verified the correctness of this statement by incorporating it with whatever ointment I might be applying to the prostate in middle-aged and old men. Impotency, according to my experience, in middle life is oftener due to disease of the prostate than to failure of the generative functions.

A case in point was that of a gentleman of sixty, wounded on one of the gunboats in the attack on Fort Donelson, which battle gave me my first experience in practical surgery. This gentleman had received a gunshot wound in the loins, and as I found his bladder enormously distended from retention, I at first supposed that the spinal nerve-centre had been injured by the shot. But in attempting to pass the catheter I was obliged to insert a finger in the rectum to guide it, and noticed that the prostate gland was very much enlarged. On questioning him, I discovered that he had been subject to attacks of retention of urine from congestion of the prostate for two or three years, and for a still longer period had lost the power of erection almost entirely, although the seminal secretion appeared to be abundant. It chanced that the only lubricant on hand for the catheter was a small wooden box of ointment, a compound of hydrarg. bichlor. cum belladon. et ext. ergotæ, which I had been using as a dressing for scrofulous ulcers on the legs of a patient at St. Mary's Hospital at Cincinnati, and which I had carried down to Fort Donelson in my coat-pocket. I used it on the catheter in the old gentleman's case simply because it was the only thing I had to oil it with, and without stopping to think much about it. Circumstances were such that he remained under my observation while recovering from the wound in the back, and, at his solicitation, I used the preparation several times afterwards on the catheter with which I drew his water, as it seemed to relieve the feeling of fulness in the rectum of which he complained, and enabled him to pass water with greater ease. A year later this gentleman visited me at Louisville, where I was then located, for the purpose of being catheterized, not so much on account of the difficulty in passing water, which, he stated, was measurably relieved, but to secure the use of a similar ointment to that formerly used. He informed me that not only was the prostatic trouble much betfer, but that nearly normal erections had returned. I continued the applications, using the *porte caustique* instead of the catheter, for some three or four months with such marked benefit that my patient, who was a widower, got married some six months later.

I merely mention this incident to show how we sometimes stumble upon important discoveries through the merest accident. Although there was nothing particularly novel in this method of treatment, it was new to me at that time, and even now the treatment of disease of the prostate by means of medicaments applied directly to the prostatic portion of the urethra has not received that patient investigation which its merits deserve. Some physicians do not seem to recognize the source of prostatic trouble. I have met with many cases in which the senseless operation of splitting up the meatus had been performed for urinary derangement due to an enlarged prostate.

In conclusion, I will add that my practice

for the past twenty years has been such as to bring me in contact with numerous cases of prostatic disease. In most of these cases the patients did not suspect that they were laboring under any prostatic affection, but applied for treatment either on account of spermatorrhœa, loss of sexual power, or urinary trouble. I have in many cases found it difficult to convince them that the source of trouble was in the prostate gland. Some, indeed, could not be convinced, having formed a theory of their own, derived from pernicious quack publications, and they of course were lost. But whenever the patient has had the strength of will, and, above all, the confidence in advice, to adhere faithfully to the treatment which I have here indicated, the relief has been as gratifying as it was marked and unexpected.

It is not by any means to be understood that these local applications are the only treatment required in such cases. They all require general treatment according to the indications present in each case, but the object of this paper is to emphasize the value and importance of local applications to the prostate, and it would extend it much beyond the original limits imposed upon it to enter into a discussion of the general management and medical treatment of these diseases, which I have considered at some length in a former monograph.

There is the same necessity for alterative treatment, renal resolvents, general and special nerve tonics, and restorative medication, according to the individual peculiarities of each case, and the age and general physical condition of the patient. Local applications are not intended to supplant any of the usual means employed for anchoring frail humanity to earth awhile longer, but they supplement, aid, and assist them, and materially increase their efficacy and success, and render the results of our treatment more satisfactory and relief more certain and speedy.

Finally, medical practitioners should impress the fact upon their patients that the first serious indication of prostatic disease is some imperfection in the act of micturition, and *whenever any trouble is experienced in passing water for any considerable length of time, suspect disease of the prostate gland.*

189 Wisconsin Street.

THE ANTIPYRETIC ACTION OF ANTIFEBRIN.

By Dr. E. W Evans, Easton, Penna.
(From the private laboratory of Dr. Ott.)

Part II.—On the Fevered Animal.

SINCE the publication of Part I. in the April number of this journal, I have made the following experiments in order to observe the action of antifebrin in the presence of a pyrogenic agent, deutero-albumose being employed, it having been demonstrated by Ott and Collmar* that the albumoses and peptones were active heat-producing agents, the fever setting in at the end of the first half-hour and continuing for about three hours. The dose used by them being from .015 to .020 gramme.

In all of my experiments I have not used less than this, and in some cases more, getting a rise in all of from .5° to 1.4° in the first hour after injection into the jugular. And at the end of the hour, when the fever was still on the incline, the antifebrin was given in the same manner, and the animal replaced in the chamber of the calorimeter.

These experiments are certainly significant in the uniformity of their results, as will be shown, there being not a single case in which there was not a reduction both in the production and the dissipation of heat, although the doses of the pyrogenic and the antipyretic agents varied greatly.

Experiment 1.—Rabbit; weight, 1.88 pounds.

P.M.
2.30 .020 gramme of deutero-albumose injected into jugular; rectal temp. at time of injection 101.6°.

Time. P.M.	Rec. temp.	Cal. temp.
3.42	102.4°	70.55°
4.42	102.6°	70.71°
		.16°

5.00 .00375 gramme of antifebrin injected into jugular.

Time. P.M.	Rec. temp.	Cal temp.
5.10	102.4°	71.35°
6.10	102.8°	71.47°
		.12°

RESULTS.

Hourly heat after dissipation deutero-albumose	4.88
Hourly heat production after deutero-albumose	5.19
Hourly heat dissipation after antifebrin	2.79
Hourly heat production after antifebrin	3.41

* "Albumose and Peptone Fever," *Medical News*, February 19, 1887.

SUMMARY.

Hourly heat dissipation after deutero-albumose.....	4.88
Hourly heat dissipation after antifebrin.....	2.79
Loss in heat dissipation.....	2.09
Hourly heat production after deutero-albumose.....	5.19
Hourly heat production after antifebrin.....	3.41
Loss in heat production.....	1.78

Experiment 2.—Rabbit; weight, 4.52 pounds.

P.M.
2.10 .02 gramme deutero-albumose injected into jugular; rect. temp. 101.2°.

Time. P.M.	Rec. temp.	Cal. temp.
2.42	101.6°	68.14°
3.42	102.6°	68.85°
		.71°

.55 gramme of antifebrin injected into jugular.

Time. P.M.	Rec. temp.	Cal. temp.
4.10	100°	68.85°
5.10	99.8°	69.15°
		.30°

RESULTS.

Hourly heat dissipation after deutero-albumose...	30.11
Hourly heat production after deutero-albumose...	33.86
Hourly heat dissipation after antifebrin.....	12.62
Hourly heat production after antifebrin.....	11.87

SUMMARY.

Hourly heat dissipation after deutero-albumose ...	30.11
Hourly heat dissipation after antifebrin.....	12.62
Loss in heat dissipation	17.49
Hourly heat production after deutero-albumose...	33.86
Hourly heat production after antifebrin.....	11.87
Loss in heat production.....	21.99

Experiment 3.—Rabbit; weight, 4.28 pounds.

P.M.
2.30 .02 gramme deutero-albumose injected into jugular; rect. temp. 101.6°.

Time. P.M.	Rec. temp.	Cal. temp.
2.52	101.8°	66.76°
3.52	102.5°	67.66°
		.90°

.45 gramme of antifebrin injected into jugular.

Time. P.M.	Rec. temp.	Cal. temp.
4.12	101.6°	67.79°
5.12	100.8°	68.44°
		.65°

RESULTS.

Hourly heat dissipation after deutero-albumose...	38.10
Hourly heat production after deutero-albumose...	40.59
Hourly heat dissipation after antifebrin.....	27.37
Hourly heat production after antifebrin.....	24.52

SUMMARY.

Hourly heat dissipation after deutero-albumose...	38.10
Hourly heat dissipation after antifebrin.....	27.52
Loss in heat dissipation.....	10.58
Hourly heat production after deutero-albumose...	40.59
Hourly heat production after antifebrin.....	24.52
Loss in heat production.....	16.07

Experiment 4.—Rabbit; weight, 3.42 pounds.

P.M.
2.00 .04 gramme deutero-albumose injected into jugular; rect. temp. 101.6°.

Time. P.M.	Rec. temp.	Cal. temp.
2.40	102.2°	70.50°
3.40	102.6°	71.00°
		.50°

.15 gramme of antifebrin injected into jugular.

Time. P.M.	Rec. temp.	Cal. temp.
4.07	101.2°	71.05°
5.07	101.8°	71.35°
		.30°

RESULTS.

Hourly heat dissipation after deutero-albumose...	20.56
Hourly heat production after deutero-albumose...	21.70
Hourly heat dissipation after antifebrin.....	12.53
Hourly heat production after antifebrin.....	14.24

SUMMARY.

Hourly heat dissipation after deutero-albumose ...	20.56
Hourly heat dissipation after antifebrin.....	12.53
Loss in heat dissipation.....	8.03
Hourly heat production after deutero-albumose...	21.70
Hourly heat production after antifebrin.....	14.24
Loss in heat production.....	7.46

Experiment 5.—Rabbit; weight, 3.74 pounds.

P.M.
1.45 .04 gramme deutero-albumose injected; rect. temp. 102.6°.

Time. P.M.	Rec. temp.	Cal. temp.
2.25	102.8°	67.85°
3.25	103.1°	68.65°
		.80°

.2 gramme of antifebrin injected into jugular.

Time. P.M.	Rec. temp.	Cal. temp.
3.40	101.1°	68.70°
4.40	100.1°	69.15°
		.45°

RESULTS.

Hourly heat dissipation after deutero-albumose....	33.34
Hourly heat production after deutero-albumose...	34.27
Hourly heat dissipation after antifebrin.....	18.66
Hourly heat production after antifebrin.....	15.55

SUMMARY.

Hourly heat dissipation after deutero-albumose....	33.34
Hourly heat dissipation after antifebrin.....	18.66
Loss in heat dissipation.....	14.68
Hourly heat production after deutero-albumose...	34.27
Hourly heat production after antifebrin.....	15.55
Loss in heat production.....	18.72

Experiment 6.—Rabbit; weight, 3.80 pounds.

P.M.
1.45 .05 gramme deutero-albumose injected into jugular; rect. temp. 101.9°.

Time. P.M.	Rec. temp.	Cal. temp.
2.27	102.3°	67.09°
3.27	103.2°	67.69°
		.60°

.2 gramme of antifebrin injected into jugular.

Time. P.M.	Rec. temp.	Cal. temp.
3.52	101.2°	67.79°
4.52	101.2°	68.29°
		.50°

RESULTS.

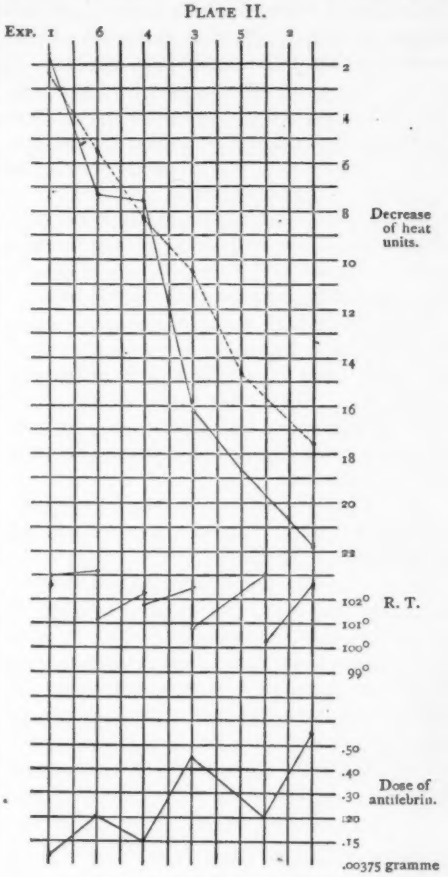
Hourly heat dissipation after deutero-albumose...	25.13
Hourly heat production after deutero-albumose....	27.97
Hourly heat dissipation after antifebrin.....	20.83
Hourly heat production after antifebrin.....	20.83

SUMMARY.

Hourly heat dissipation after deutero-albumose....	25.13
Hourly heat dissipation after antifebrin.....	20.83
Loss in heat dissipation	5.30
Hourly heat production after deutero-albumose ...	27.97
Hourly heat production after antifebrin.....	20.83
Loss in heat production.....	7.14

Upon reviewing the results of these experiments, as collected in the table, the uniformity previously spoken of becomes quite evident. But perhaps the accompanying plate, where I have arranged the curves of heat production and heat dissipation in direct relation to the temperature and the dose exhibited, may show it still more clearly.

PLATE II.



- - - - heat dissipation; ——— heat production.

PLATE II.—The dotted line shows heat dissipation and the straight line heat production; the curves below the zero line, which is the normal line, represent so many units of decrease in heat production and heat dissipation after the use of the antifebrin. The dose and temperature curves are below. Thus, in Experiment 3, the dose is .45 gramme, heat production and heat dissipation are diminished, and the temperature fell from 102.5° to 100.8°.

Table No. 3.—Antifebrin Experiments on Fevered Animals.

Experiment.	Duration.	Weight of animal.	Dose of antifebrin.	Hourly heat dissipation.				Hourly heat production.			
				After deutero-albumose.	After antifebrin.	Decrease.	Increase.	After deutero-albumose.	After antifebrin.	Decrease.	Increase.
	Hrs.	Pounds.	Grams.								
1	2	1.88	.00375	4.88	2.79	2.09	.....	5.19	3.41	1.78	.....
2	2	4.52	.55	30.11	12.62	17.49	.....	33.86	11.87	21.99	.....
3	2	4.28	.45	38.10	27.52	10.58	.....	40.59	24.52	16.07	.....
4	2	3.42	.15	20.56	12.53	8.03	.....	21.70	14.24	7.46	.....
5	2	3.74	.20	33.34	18.66	14.68	.....	34.27	15.55	18.72	.....
6	2	3.80	.20	25.13	20.83	5.30	.....	27.97	20.83	7.14	.....

In the calorimeter experiments made with albumoses by Ott and Collmar it was determined that the fever obtained was produced by an increase of heat production and a decrease in heat dissipation. In my experiments the temperature reduction, which occurred in

two-thirds of them, was due to the great decrease of heat production in excess of the accompanying decrease in heat dissipation; since in the two experiments where the temperature continued to rise after the antifebrin had been injected, the reduction of heat production was small in comparison with the reduction in heat dissipation.

In most of these experiments, particularly when large doses had been given, a peculiar cyanotic condition of the ears appeared shortly after the administration of the antifebrin.

Upon analysis of the blood in these cases with the Sorby-Browning micro-spectroscope, the third band of methæmoglobin was distinctly seen. The drug evidently alters the coloring-matter of the blood, progressively changing and reducing the oxyhæmoglobin to methæmoglobin.

This cyanosis has also been frequently noticed by many observers in the clinical application of the drug.

In conclusion, it is evident that acetanilide is a powerful, safe, and certain antithermic agent, and that its antipyretic effect in fever is due to the reduction it causes in the amount of heat produced; whether by direct stimulation of the inhibitory heat centre, paresis of the spinal heat centres, or by an action on the tissues themselves, remains to be demonstrated.

THE INFLUENCE OF ANTIFEBRIN, SALICYLIC ACID, AND CARBOLIC ACID ON NORMAL AND ABNORMAL BODILY TEMPERATURE.

By H. A. Hare, M.D. (Univ. of Pa.).*

SOME months since there appeared in the Gazette quite a lengthy study on fever, and the agents which produced and combated it, by Dr. Wood, Dr. Reichert, and myself, and the following series of experiments may in a manner be considered as a continuation of the former ones.†

At the time these experiments were begun no calorimetrical investigations as to the manner in which these agents act had been performed, and it is only within the last few weeks that a short but elaborate paper has appeared in this journal on the influence of antifebrin on bodily heat by Dr. Evans, of Easton, Pa. With the exception of this last-named investigation the profession possesses the results of no true calorimetrical observations on these three constantly used drugs, and it was this dearth of information which provoked these experiments.

The objects of the research have been, therefore, as follows:

First.—To determine the effect of each drug on normal temperature in the animal, which was free to come and go as it chose.

Second.—To discover what changes came about in the circulation during the alterations in the normal bodily temperature.

Third.—To determine what changes in the circulation occurred when the drug was influencing bodily temperature above normal.

Fourth.—To study in what manner these changes in temperature were produced, both with and without fever, or, in other words, whether these agents reduced bodily heat by altering heat production or dissipation, or both.

I. Antifebrin.

I have made ten experiments on the influence of antifebrin on normal rectal temperature, which show that this drug possesses to a marked degree the power of reducing bodily heat when no fever is present. In every instance there followed after the injection of the drug a very considerable fall, in some cases amounting to more than a degree Fahrenheit.

The following experiments, which agree in all respects with the others made on this point, will serve as examples:

Experiment 1.—Rabbit; weight, 2½ pounds.

Time. A.M.	Drug.	Rec. temp.
11.05	.....	$102\frac{3}{5}^{\circ}$
11.07	½ gr.	.....

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* Demonstrator of Experimental Therapeutics and Instructor in Physical Diagnosis in the University of Pennsylvania.

† For the manner in which fever was produced, and any other details concerning the methods of this research, the writer must refer to the paper just mentioned.

The writer desires to call attention to the statement made in this joint paper that a thermogenic substance in the pepsin was a pepsin-peptone, as his researches make this somewhat doubtful. He has found that certain commercial pepsins charged with peptone fail absolutely to produce increase in bodily temperature, but, on the contrary, decrease it. This is of course in accord with the well-known fact that the commercial peptone of Grübler decreases animal temperature. It is plain that if the fever-producing agent really is a peptone, there must be two peptones in the commercial article, one of which decreases and the other increases bodily temperature. The relations of peptones to albumoses is so exceedingly close that it is quite probable that the so-called pepsin-peptone may be an albumose.

Time.	Drug.	Rec. temp.	Remarks.
P.M.			
11.27	.....	102°	
11.47	.....	101°	Animal very quiet.
12.07	.....	101⅗°	Animal brisk as ever.
12.27	.....	101⅗°	
12.47	.....	101⅘°	
1.07	.....	103°	

Experiment 2.—Rabbit; weight, 2¼ pounds.

Time.	Drug.	Rec. temp.
P.M.		
1.13	.....	103°
1 15	½ gr.	.....
1.35	.....	101⅖°
1.55	.....	100⅘°
2.15	.....	101⅗°
2.35	.....	101⅘°
2.55	.....	102°
3.15	.....	102⅖°

Experiment 3.—Rabbit; weight, 2 pounds.

Time.	Drug.	Rec. temp.
P.M.		
1.05	.....	102⅗°
1.07	½ gr.	... ..
1.27	.....	101°
1.47	.....	101°
2.07	.....	101⅖°
2.27	.....	102°
2.47	.....	102⅖°
3.07	.....	102°

On studying the influence of antifebrin on bodily temperature and its relations to arterial pressure, we find that under normal conditions it generally produces a fall of temperature and a fall of pressure; but this is not by any means a constant action of the drug, since in Experiment 6 we see that though the temperature was decreased there was not a fall, but a rise of arterial pressure. This one exception would have but little weight against the others were it not that the fall of arterial pressure, when it did occur in the others, was not steady, but interrupted by temporary and unexplained rises; in other words, pressure and temperature did not fall side by side. Notwithstanding this fact, however, it is a just and proper conclusion that antifebrin in producing a lowering of temperature also acts as an arterial sedative.

Just here it may be well to call attention to the action which the drug possessed in Experiment 7, namely, causing sudden cardiac failure from an unknown cause. In this experiment the animal died suddenly, so suddenly that the arterial pressure fell to zero from a considerable height in ten or fifteen seconds.

Death came without a tremor, a gasp, or any sign of an approaching cardiac failure.

On making an autopsy a small clot was found in the left ventricle, and there was also a long, well-formed clot extending from the canula in the carotid to the innominate artery.

The death was evidently due to this cause.

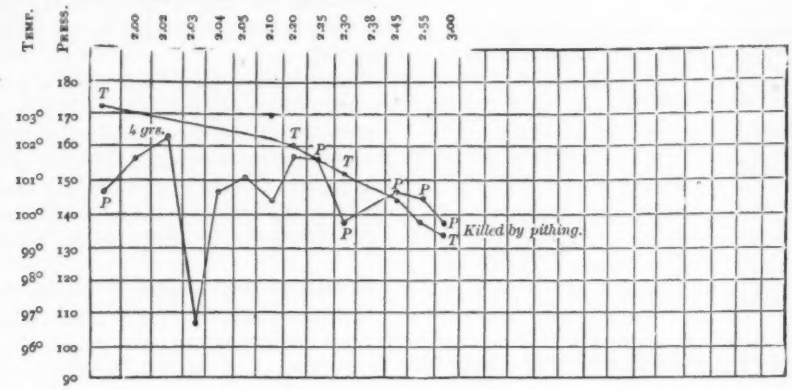
When antifebrin is injected into the jugular vein in an animal suffering from the pepsin fever it apparently has little, if any, effect on the pyretic condition, and both temperature and pressure mount upwards as if free from any inhibiting influence. This is the more remarkable since we have already discovered that this drug depresses normal temperature, but it may be that it is not able to cope with systemic changes produced by the pepsin. A glance at the charts will show this statement to be a fact, and we will now pass on to a consideration of its action on the production and dissipation of heat, hoping thereby to discover some cause for this rather remarkable result, for, as is well known, most drugs which depress normal temperature possess still greater powers over abnormal temperature.

From the experiments on heat production and dissipation in the normal animal we are able to draw the following conclusions, viz., that this drug reduces bodily temperature both by increasing dissipation and decreasing production. (See Experiments 12, 13, 14, and 15.)

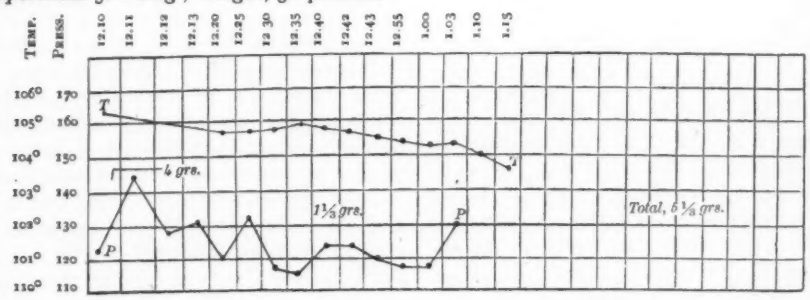
By the above the writer does not mean to insinuate that antifebrin decreases temperature by a double action necessarily in any one case, but rather that in one case the temperature is decreased by increased dissipation, and in another by decreased production.

Charts showing Arterial Pressure and its Relationship to Temperature, also the Fall of Temperature produced by Antifebrin.

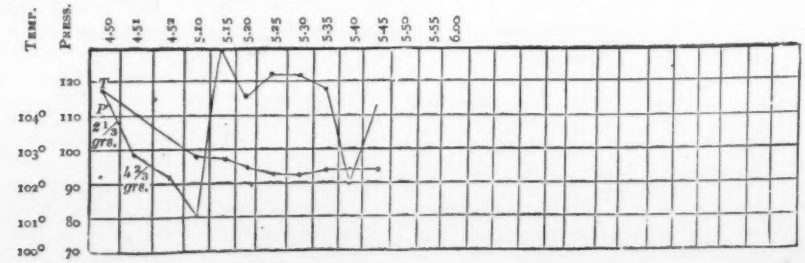
Experiment 4.—Dog; weight, 13 pounds.



Experiment 5.—Dog; weight, 32 pounds.

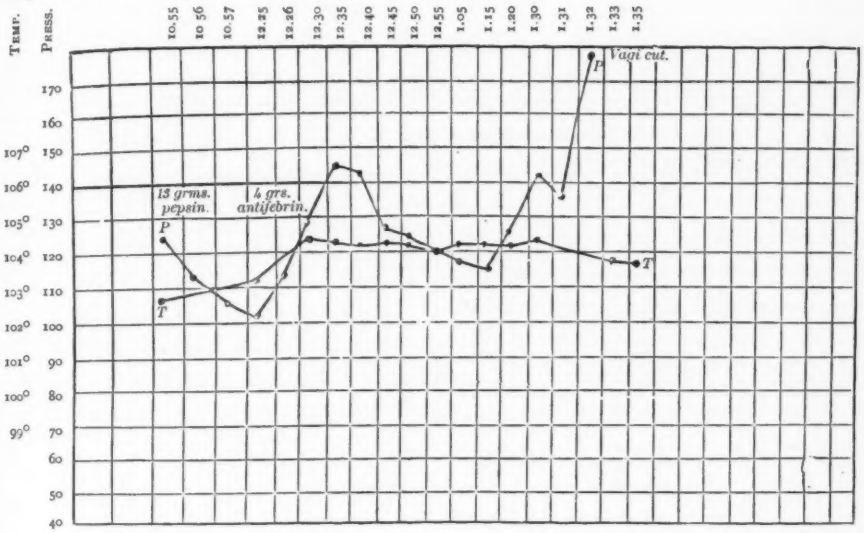


Experiment 6.—Dog; weight, 35 pounds.

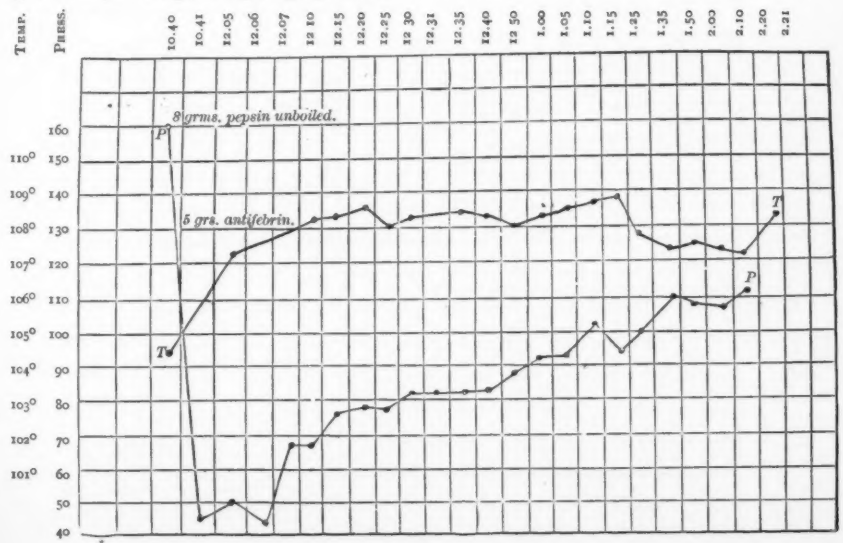


Charts showing Arterial Pressure and its Relationship to Temperature, also the Fall of Temperature produced by Antifebrin in "Pepsin Fever."

Experiment 8.—Dog ; weight, 30 pounds.

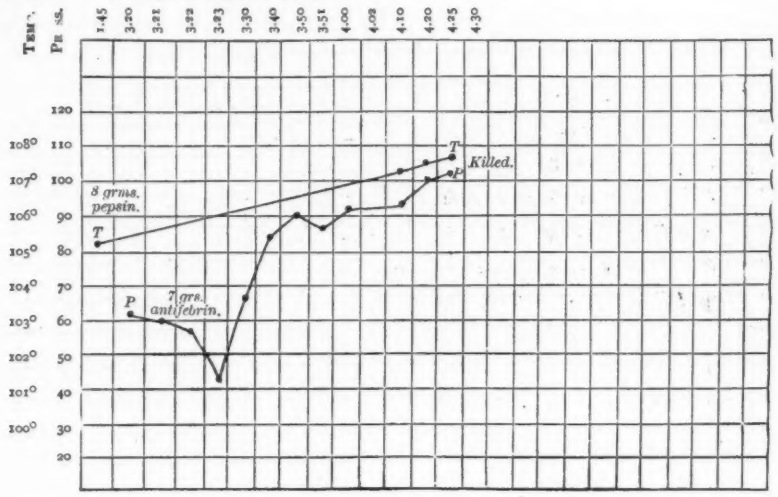


Experiment 9.—Dog ; weight, 36 pounds.

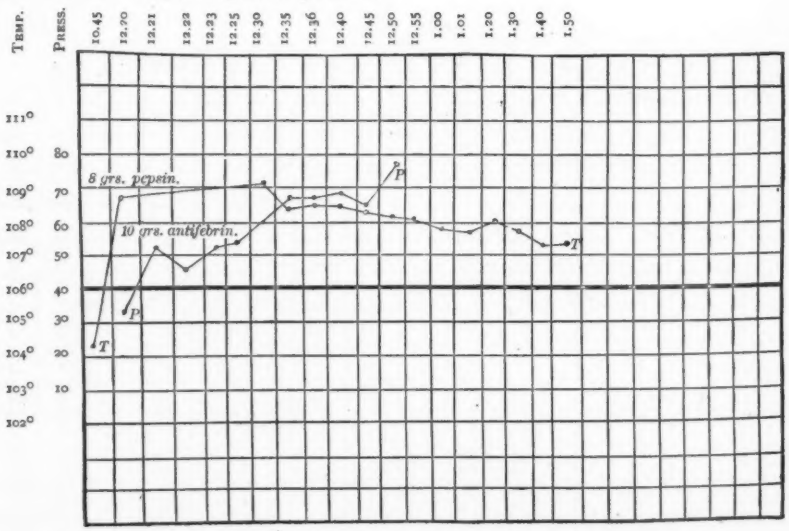


Charts showing Arterial Pressure and its Relationship to Temperature, also the Fall of Temperature produced by Antifebrin in "Pepsin Fever" (Continued).

Experiment 10.—Dog; weight, 25 pounds.



Experiment 11.—Dog; weight, 46 pounds.



Experiment 12.—Dog; weight, 22 pounds.

Time.	Rec. temp.	Box temp.
A.M.		
9.00	105.30°	51.60°
10.00	.....	53.05°
11.00	105.25°	54.50°
	.05°	2.99°
11.15	6 grs. antifebrin into jugular.	
11.15	104.25°	54.55°
12.15	.....	56.15°
1.15	104.20°	57.05°
	.05°	2.50°

Hourly dissipation of heat before drug 176.9000
Hourly production of heat before drug..... 176.4875

Hourly dissipation of heat after drug..... 152.5000
Hourly production of heat after drug..... 152.0125

SUMMARY.

Hourly dissipation of heat before drug..... 176.900
Hourly dissipation of heat after drug..... 152.500

Hourly loss of heat dissipation after drug. 24.400

Hourly production of heat before drug..... 176.4875
Hourly production of heat after drug..... 152.0125

Hourly loss of heat production after drug. 24.4750

Result.—*Loss* of both dissipation and production, the latter being more decreased than the former.

Experiment 13.—Dog; weight, 36 pounds.

Time.	Rec. temp.	Box temp.
P.M.		
1.20	102.7°	59.15°
2.20	.....	.....
3.20	103.0°	62.00°
	.3°	2.85°
3.30	6 grs. antifebrin into jugular.	
4.00	102.5°	62.25°
5.00	.....	64.05°
6.00	102.7°	65.80°
	.2°	3.55°

Hourly dissipation of heat before drug..... 173.850
Hourly production of heat before drug..... 177.900

Hourly dissipation of heat after drug..... 216.550
Hourly production of heat after drug..... 219.250

SUMMARY.

Hourly dissipation of heat before drug..... 173.850
Hourly dissipation of heat after drug..... 216.550

Hourly gain of dissipation after drug.... 42.700

Hourly production of heat before drug..... 177.900
Hourly production of heat after drug..... 219.250

Hourly gain of production after drug.... 41.350

Result.—Gain of both dissipation and production, the former being more increased than the latter.

Experiment 14.—Dog; weight, 17 pounds.

Time.	Rec. temp.	Box temp.
A.M.		
10.25	103.0°	61.55°
11.25	104.2°	62.20°
	1.2°	.65°
11.35	6 grs. antifebrin into jugular.	
11.45	103.4°	62.15°
12.45	104.3°	63.30°
	.9°	1.15°

Hourly dissipation of heat before drug..... 79.300
Hourly production of heat before drug..... 94.600

Hourly dissipation of heat after drug..... 140.300
Hourly production of heat after drug..... 151.775

SUMMARY.

Hourly dissipation of heat before drug..... 79.300
Hourly dissipation of heat after drug. 140.300

Hourly gain of dissipation after drug.... 61.000

Hourly production of heat before drug..... 94.600
Hourly production of heat after drug..... 151.775

Hourly gain of production after drug.... 57.175

Result.—Gain of both dissipation and production, the former being greater than the latter.

Experiment 15.—Dog; weight, 20¼ pounds.

Time.	Rec. temp.	Box temp.
P.M.		
12.53	103.7°	63.25°
1.53	104.5°	64.25°
	.8°	1.00°
2.00	6 grs. antifebrin into jugular.	
2.10	103.7°	64.25°
3.10	104.9°	65 15°
	1.2°	.90°

Hourly dissipation of heat before drug..... 122.000
Hourly production of heat before drug 134.156

Hourly dissipation of heat after drug..... 109.800
Hourly production of heat after drug..... 128.025

SUMMARY.

Hourly dissipation of heat before drug 122.000
Hourly dissipation of heat after drug..... 109.800

Hourly loss of dissipation after drug... 12.200

Hourly production of heat before drug..... 134 1500
Hourly production of heat after drug..... 128.0250

Hourly loss of production after drug... 6.1250

Result.—Loss of both dissipation and production, the former being more affected than the latter.

Experiment 16.—Dog; weight, 19 pounds.

Time.	Rec. temp.	Box temp.
A.M.		
10.20	104.6°	64.60°
11.20	104.8°	65.85°
	.2°	1.25°
11.25	6 grs. of antifebrin.	
11.30	104.3°	65.65°
12.30	105.0°	66.90°
	.7	1.25°

Hourly dissipation of heat..... 152.500
Hourly production of heat..... 155.350

Hourly dissipation of heat after drug..... 152.500
Hourly production of heat after drug..... 162.475

SUMMARY.

Hourly dissipation of heat before drug..... 152.500
Hourly dissipation of heat after drug..... 152.500

Hourly dissipation after drug unchanged.

Hourly production of heat before drug..... 155.350
Hourly production of heat after drug..... 162.475

Hourly gain of production after drug.... 7.125

Result.—Dissipation not affected, but production increased.

The influence of antifebrin and thermogenesis during fever seems to consist in a lessened amount of heat production and also an increased heat dissipation on some occasions.

Experiment 17.—Dog; weight, 17½ pounds.

10.40 Rec. temp. 103°. Injected 2 grs. pepsin.

Time.	Rec. temp.	Box temp.
A.M.		
11.10	105.3°	65.30°
12.10	105.0°	66.30°
	.3°	1.00°
12.13	6 grs. of antifebrin into jugular.	
12.15	105°	66.20°
1.15	102°	67.00°
	3°	.80°

Hourly dissipation of heat..... 122.0000
Hourly production of heat..... 119.0625

Hourly dissipation after drug..... 97.6000
Hourly production after drug..... 58.2250

SUMMARY.

Hourly dissipation before drug..... 122.0000
Hourly dissipation after drug..... 97.6000

Hourly loss of dissipation after drug... 25.4000

Hourly production of heat before drug..... 119.0625
Hourly production of heat after drug..... 58.2250

Hourly loss of production after drug... 60.8375

Result.—Loss of production and dissipation, the former being most affected.

Experiment 18.—Dog; weight, 28⅕ pounds.

12.20 Rec. temp. 102.5°. Injected 2 grs. filtered pepsin.

Time.	Rec. temp.	Box temp.
P.M.		
1 20	105.3°	67.00°
2.20	105.2°	68.10°
	.1°	1.10°
2.35	8 grs. antifebrin into jugular.	
2.45	105.3°	68.15°
3.45	105.1°	68.95°
	.2°	.80°

Hourly dissipation of heat..... 134.200
Hourly production of heat..... 132.070

Hourly dissipation of heat after drug..... 97.600
Hourly production of heat after drug..... 93.330

SUMMARY.

Hourly dissipation before drug..... 134.200
Hourly dissipation after drug..... 97.600

Hourly loss in dissipation after drug..... 36.600

Hourly production of heat before drug..... 132.070
Hourly production of heat after drug..... 93.330

Hourly loss in production after drug..... 38.740

Result.—Loss of both functions, production being most decreased.

Experiment 19.—Dog; weight, 18½ pounds.

3.00 Rec. temp. 103.3°. Injected 2 grs. filtered pepsin.

Time.	Rec. temp.	Box temp.
P.M.		
3.50	104.8°	68.75°
4.50	105.1°	69.20°
	.3°	.45°
4.53	6 grs. of antifebrin into jugular.	
4.55	105°	69.00°
5.55	104°	69.70°
	1°	.70°

Hourly dissipation of heat..... 54.9000
Hourly production of heat..... 59.0625

Hourly dissipation after drug..... 85.4000
Hourly production after drug..... 71.5250

SUMMARY.

Hourly dissipation of heat before drug..... 54.9000
Hourly dissipation of heat after drug..... 85.4000

Hourly gain of dissipation..... 30.5000

Hourly production of heat before drug..... 59.0625
Hourly production of heat after drug..... 71.5250

Hourly gain of production after drug... 12.4625

Result.—Gain of both functions, chiefly of dissipation.

Experiment 20.—Dog; weight, 15 pounds.

10.20 Rec. temp. 103.5°. Injected 1½ grs. pepsin in jugular.

Time.	Rec. temp.	Box temp.
A.M.		
10.45	104.6°	67.40°
11.45	104.5°	68.40°
	.1°	1.00°
11.48	5 grs. of antifebrin into jugular.	
11.50	104.6°	68.50°
12.50	105.0°	69.40°
	.4°	.90°

Hourly dissipation of heat..... 122.0000
Hourly production of heat..... 120.8750

Hourly dissipation of heat..... 109.8000
Hourly production of heat..... 114.3000

SUMMARY.

Hourly dissipation of heat before drug..... 122.0000
Hourly dissipation of heat after drug..... 109.8000

Hourly loss of dissipation after drug... 12.2000

Hourly production of heat before drug..... 120.8750
Hourly production of heat after drug..... 114.3000

Hourly loss of heat production after drug. 6.5750

Result.—Loss of both functions, dissipation being decreased the most.

Experiment 21.—Dog; weight, 24 pounds.

10.30 Rec. temp. 103°. Injected 3 grs. filtered pepsin.

Time.	Rec. temp.	Box temp.
A.M.		
11.10	103.7°	61.25°
12.10	105.2°	62.55°
	1.5°	1.30°
12.25	Injected 6 grs. of antifebrin into jugular.	
12.30	105.0°	62.35°
1.30	105.3°	63 60°
	.3°	1.25°

Hourly dissipation of heat..... 158.600
Hourly production of heat..... 185.600

Hourly dissipation of heat after drug..... 152.500
Hourly production of heat after drug..... 157.920

SUMMARY.

Hourly dissipation of heat before drug..... 158.600
Hourly dissipation of heat after drug..... 152.500

Hourly loss of dissipation after drug..... 6.100

Hourly production of heat before drug..... 185.600
Hourly production of heat after drug..... 157.920

Hourly loss of production after drug..... 27.680

Result.—Loss of both functions, production being greatly decreased.

CONCLUSIONS.

1. ***Antifebrin*** effects ***marked*** depression of normal bodily temperature.

2. During the depressing action of antifebrin on normal temperature it seems to cause a slight fall in arterial pressure, although this is by no means a constant result, as it may cause a rise.

In the opinion of the writer, however, this drug in lowering temperature acts as an arterial sedative.

3. Notwithstanding the fact that antifebrin influences to such a marked degree normal bodily heat, it seems to possess little power against the pyrexia produced by the introduction of pepsin into the blood, since under these circumstances the hitherto depressed pressure rises, as does also the bodily heat.

This curious fact must depend on some organic changes produced by the digestive ferment.

4. This drug reduces ***normal*** temperature apparently by influencing both production and dissipation.

5. Antifebrin in fever chiefly reduces the high temperature by decreasing heat production, and is therefore a valuable antipyretic.

(To be continued.)

A CLINICAL STUDY OF ANTIPYRIN AND ANTIFEBRIN.

By G. Walter Barr, M.D., Bridgeport, Ill.

I AM just convalescing from an attack of fever lasting five weeks, during which I made a careful study of antipyrin and antifebrin. The disease was neurasthenia complicated with malaria. My notes from observations taken every fifteen minutes for a long period of time would almost fill this journal, and therefore only generalizations are given.

The dose of antipyrin taken was at first 10 grains, which was increased gradually to 23 grains for a person of nervous temperament, who requires average doses of other drugs. Toleration of antipyrin increases after a week's use of the drug, and the dose must be constantly increased if it be used long.

Ten minutes after the ingestion of a dose of antipyrin in gelatin capsules an aromatic warmth is felt in the stomach to a slight degree, and ten minutes later a glow seems to spread over the whole body, and is followed by sweating, and in a neurasthenic, irritable person, considerable tranquillity of mind ensued five minutes later. This psychological effect lasted half an hour.

In thirty-five minutes the temperature fell 1° F. The sweating gradually lessened, and ceased in two and a half hours after the drug was taken. In two hours from its ingestion the temperature had fallen about 3° F. This was regardless of the temperature when the antipyrin was taken, which varied from 101° to 105° F. However, it never lowered the temperature below the norm.

The above phenomena were constant. Almost constantly, about fifteen minutes after the dose was taken, the breath had an odor of

ol. carui, sometimes very strong and often more faint. This lasted for about an hour.

The fever invariably began to rise in two and a half hours after the dose of antipyrin was taken, and the antipyretic effect was certainly only transitory. The after-effect was a general, indescribable feeling of greater *malaise*. The only effect on the pulse was its slowing, but the pulse was affected in great disproportion to the temperature and became, on a basis of temperature, abnormally high, though absolutely lower. There was little or no change in the amount and gross appearance of the urine.

Antifebrin was used after antipyrin was begun, and at the same time alternately with the latter. The dose ranged from 5 grains to 13 grains. A tolerance was established to it. A number of times the same caraway odor on the breath was perceived, causing very interesting speculations as to the resultant of the corporeal chemistry upon both antipyrin and antifebrin. The aromatic, stomachic sensation was very seldom felt, the bodily glow and perspiration being generally the first effects noticed from antifebrin when the caraway breath was absent.

Antifebrin causes a fall of temperature in an hour or an hour and a half after its ingestion in gelatin capsules. The fall from one dose is about 4° F., though the norm was never passed in its downward tendency. The decline was maintained for an average of six hours, after which the temperature began to rise again. It has no permanent effect on the fever if its constant use for several weeks is a criterion. It gently stimulated the mind and affected the muscular system almost precisely like coca. I was several times as strong while under the influence of antifebrin as at other times, and intellectual indolence gave way to more energy. The tonicity of the pulse was increased and the rate slowed. Its effect on the pulse resembles that of convallaria majalis. Antifebrin is decidedly diuretic and less diaphoretic than antipyrin. There were no after-effects, not even the depression to be expected after the stimulation it produced. Once the dose of antifebrin had not the slightest physiological effect. The conditions were exactly the same as at other times as near as I could discover, after very careful examination. An ordinary dose of antipyrin immediately acted as usual, and antifebrin afterwards did well. Perhaps some internal conditions hardened the capsule. Every dose of both drugs was taken in an empty stomach. My curiosity led me to wish for another failure that I might try another dose of antifebrin, but the opportunity never came. To sum up,—

ANTIPYRIN.	ANTIFEBRIN.
Lowers temperature in half an hour.	In an hour or more.
Effect lasts two hours.	Effect lasts six hours.
More diaphoretic.	More diuretic.
Depressing after-effects.	No after-effects.
Cerebral sedative.	Cerebral vaso-motor and muscular (?) stimulant.
Dose, 15 to 30 grains.	Dose, 5 to 15 grains.
Tolerance from continued use.	Ditto.

The above table will suggest the selective use of the two drugs. From the patient's point of view (which is really coincident with the physician's) antifebrin is much to be preferred in continued fevers, because the dose is one small capsule instead of three; the effect lasting so long requires one-third the number of doses; the tonic stimulation excels the depression and after *malaise*, and the cost is one-fourth that of antipyrin. The antipyretic action of antifebrin is as strong or stronger than that of antipyrin, and its only objection is its slowness of action. In insolation and other cases where a quickly-acting antipyretic is necessary, and when it has a specific action on the pathology of a disease, as is claimed in rheumatism, antipyrin is to be preferred. Whenever one can wait an hour for the antipyretic action to begin, I greatly prefer antifebrin, and I know the patient will also. I believe its stimulant or tonic effect to be very valuable in weak patients.

THERAPEUTIC EQUIVALENTS OF SALTS OF QUININE.

According to BOYMOND, in *Archives de Pharmacie*, the equivalents for 1 gramme anhydrous quinine are, of the hydrate, 1.16 gramme; acetate, 1.18 gramme; basic muriate, 1.22 gramme; lactate, 1.27 gramme; basic hydrobromate, 1.30 gramme; valerianate, 1.31 gramme; basic sulphate, 1.34 gramme; neutral sulphovinate, 1.39 gramme; arseniate, 1 44 gramme; basic salicylate, 1.45 gramme; citrate, 1.49 gramme; neutral hydrobromate, 1.64 gramme; neutral sulphate (bisulphate), 1.69 gramme; hydroferrocyanate, 1.77 gramme; acid hydriodide, 1.78 gramme; tannate, 4.42 grammes; citrate of iron and quinine, variable; brown quinine, variable.—*National Druggist*, May 13, 1887.

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Leading Articles.

EUCALYPTUS HONEY.

IN *Le Progrès Médical* for April 16, Dr. Thomas Caraman describes the discovery and the medical and chemical properties of a peculiar bee production, to which is given the name of black honey. In May of 1884, M. E. Guilmeth, the French naturalist and traveller, found in a wilderness in the central part of Australasia a number of enormous eucalyptus-trees, and at a great height from the ground perceived a number of dome-shaped, brownish masses, which he at first supposed to be excrescences. Late in the afternoon his attention was called to the going in and out of swarms of black insects from an opening in the dome-shaped masses, and finally, after many hours of labor, one of the trees, whose diameter was said to be between nineteen and twenty metres, was cut down. Out of a single honey receptacle M. Guilmeth took as much as eleven thousand pounds avoirdupois. The insect which secretes this honey is said to be new to science, and has been given the name of *apis nigra mellifica*. It is very small and black, and the languet of the workers is much more developed than that of the ordinary bee. All attempts to domesticate it in Tasmania have failed, but it is said that some success has been achieved in Algeria in the neighborhood of plantations of eucalyptus.

A remarkable fact stated by Dr. Caraman is that the ordinary bee condemned to feed upon the flowers of the eucalyptus-tree rapidly dies off.

The so-called black honey is at ordinary temperatures a somewhat transparent, syrupy, thick, homogeneous, dark orange-colored liquid, with a peculiar odor similar to that of eucalyptus, is very soluble in water, milk, and wines, and much less in alcohol. Its fermentation is exceedingly difficult, on account of the large quantity of levulose which it contains. Its specific gravity is 1.44, and it radiates the polarized ray at 22 degrees.

1000 parts of it contain in round numbers 611.6 parts of sugar, mostly levulose, 1.8 parts of ash, 215.6 parts of water, and 171 parts of various substances, comprising eucalyptol, eucalyptene, terpene, cymol, and odorous and resinous matters.

When black honey is given freely to dogs, dissolved in warm milk, it produces a very surprising reduction in the number of cardiac pulsations. Thus, in a feverish dog, the pulse fell from one hundred and twenty-five to seventy a minute; this fall was accompanied by a lowering of the temperature one degree centigrade; the effect lasted twenty-four hours, with a slight tendency to sleep, but with no symptoms of toxic depression.

When a tablespoonful of the honey was given to a man, dissolved in a little warm water or milk, after some minutes a slight agreeable sensation of warmth filled the whole body. In about half an hour eliminations of the active principles through the pulmonic mucous membrane commenced. The voice becomes more clear and sharper, and the breath perfumed. It seems as though the lungs themselves were more elastic.

When Dr. Caraman, who affirms that he is somewhat fleshy, took four tablespoonfuls a day for a week there was marked lessening of shortness of breath on ascending steps, and slight increased diuresis, with an augmentation of the urea. The urine acquired an odor resembling that of the *Cassie farnesiaum*, an Algerian plant, from which is prepared the perfume habitually sold under the name of new-mown hay.

Dr. Caraman believes that this honey will be a valuable remedy in the treatment of bronchial catarrhs, and that it acts as a sedative to the heart-beat, in a manner similar to

digitalis. He thinks also that it will be of practical value as a febrifuge and as a bacteriacide. He hopes much from it in the destruction of the bacilli of phthisis and the pneumococcus of pulmonic inflammations, and even asserts it has been employed in typhoid fever with success, and that in leucorrhœa, whether from accident or constitutionally, it causes the affection rapidly to disappear, and kills the leptosis vaginalis and the oxyures. He has also found it of great use in the treatment of gonorrhœa and diseases of the kidneys, bladder, and urethra, and affirms that it acts more energetically than the pobatha or sandal oil.

It is not at all probable that this substance will fulfil all the expectations of its enthusiastic advocate, but if it only do a portion of what is claimed for it, it will be a valuable addition to our therapeutic resources. If it be produced in as enormous quantities as are described by M. Guilmeth, it ought eventually to find its way into general commerce and be obtainable at a merchantable price. We do not know, however, of any of it as yet reaching this country. If it grow in importance it is probable that artificial eucalyptus and honey will be offered for sale, and it is, therefore, a matter of importance that not only the physical and medicinal properties of this drug be very carefully described, but that some test of purity be worked out.

TREATMENT OF CHRONIC SYPHILIS.

IN the treatment of chronic syphilis but too often it happens that the patient improves up to a certain point and then ceases to respond to the administration of anti-syphilitic remedies, even when they be combined with the most careful hygienic treatment and the exhibition of tonics, etc.

Any remedy which offers a fair probability of being able to carry on the amelioration of the disease under these circumstances is one worthy of very careful consideration by the profession.

Many years ago Mr. Carmichael, of Dublin, asserted that he found the oil of turpentine often of unquestionable value in the treatment of obstinate and long-continued syphilitic iritis, and during the service of Mr. G. J. Guthrie, of the Royal Ophthalmic Westminster Hospital, the practice was accompanied with alleged excellent results.

Mr. Jabez Hogg of the same hospital has recently (*Medical Press and Circular*, April 27) published the account of a case in which, after the failure of mercurials by the mouth, by inunction, and fumigation, conjoined or alternated with the use of mydriatics, tonics, iodide of ammonium, iron, etc., turpentine succeeded. It was given in ½-drachm doses, suspended in mucilage, three times a day after meals. For the first week an inunction of a twenty per cent. solution of the oleate of mercury was freely employed, but this was then laid aside, and for four months the turpentine alone was steadily persevered in. Not only was the patient's general health improved, but the corneal opacity of the iritis gradually disappeared, and at the time of the making of the report the serous exudations and other local changes in the eye had so far been absorbed or ameliorated that the vision was almost what it was before the first inflammatory attack, fourteen months previous.

THE DIURETIC ACTION OF MERCURIAL PREPARATIONS.

THE diuretic action of calomel, known to the older physicians, has been, as the readers of the GAZETTE are familiar, again brought to the attention of practitioners, and we have published testimony from a number of different observers which indicates that under certain circumstances calomel is one of the most active diuretics that we possess.

That this diuretic action is not peculiar to calomel, as has been claimed by a number of writers, but is also, though perhaps to a less degree, possessed by other mercurial preparations, has been brought into prominence by Dr. Rosenheim in a paper read before a recent meeting of the Verein für Innere Medicin of Berlin (*Therapeutische Monatshefte*, April, 1887).

The author employed corrosive sublimate, yellow iodide of mercury, and the amidato bichloride in amounts of from 1½ to 2 grains given daily. These preparations of mercury also proved themselves active diuretics in these large doses, but they produced more irritation in the intestinal canal than calomel, and also fell behind calomel in the degree of diuresis. On the other hand, the stomatitis produced by these mercurial preparations was but slight. Diuresis only follows when large doses of some mercurial preparation are rapidly absorbed, seemingly indicating that the production of diuresis is due to the acute mercurialization of the organism. The correctness of this view is ren-

dered more probable by the large amounts of mercury which are excreted through the urine.

Dr. Rosenheim's experiments with calomel still further strengthen its position as a diuretic. He employed it in sixteen cases of heart-disease complicated by dropsies, in several of which kidney complications were also present. In nine of these cases a prompt diuresis and disappearance of the œdema followed the use of calomel. In four its action was but moderately successful, and in three it entirely failed. It is worthy of notice that in all these cases before calomel was administered digitalis had been tried and proved inefficacious. Since it has been found that calomel has no direct action either on the heart or kidneys, kidney-disease offers no contra-indication to the use of calomel for the purpose of producing diuresis. In fact, Dr. Rosenheim has employed calomel for this purpose in purely nephritic dropsy. It is true that the results, however, were unfavorable. In the greater number of patients to whom calomel was administered a more or less severe stomatitis was produced, and in nearly all cases diarrhœa.

In the discussion which followed the reading of Dr. Rosenheim's paper, Dr. Leyden reported that he had treated three cases of cirrhosis of the liver with calomel. In one failure had resulted, in one marked but temporary relief, and in one a permanent amelioration.

In the treatment of dropsy from heart-disease, he regarded calomel as a valuable contribution to our therapeutic measures.

Fürbinger, on the other hand, claimed that the diuresis produced by calomel, although perhaps occurring in a high degree, was invariably ephemeral, and he regarded its mode of production as dependent upon a direct action on the glandular epithelium of the kidney, since calomel never acted as a diuretic in œdema dependent upon previous parenchymatous nephritis.

Dr. E. Biró, of Budapesth, has also confirmed the general experience of others as to the marked diuresis which follows the use of calomel, and although in his practice stomatitis, colic, and diarrhœa were frequently produced, he regards these complications of but little moment in view of the powerful action of the remedy. He has found that the degree of diuresis depends upon the intensity of the œdema, and he relates one case of mitral insufficiency in which the amount of urine was increased on the fifth day from eight hundred to six thousand eight hundred cubic centimetres. For the stomatitis, which is at the worst merely transient, he recommends a mouth-wash of potassium chlorate, and small doses of opium powder for the diarrhœa and colic.

Terray (*Pest. med. chir. Press.*, 1886) and Weinstein (*Wien. med. Blätt.*, 1887, No. 7, p. 206), whilst affirming the diuretic effects of calomel, as reported in the *Medical Chronicle*, May, 1887, draw attention to the evils which may follow its administration. Terray states stomatitis occurred in all his cases, and its intensity seemed directly proportional to the diuresis.

Weinstein records a marked increase in the excretion of urine in four cases of pleural effusion, two cases of cirrhosis of the liver, and one case of Bright's disease. But he found great evils arise from the administration of calomel as a diuretic, profuse diarrhœa, stomatitis, and salivation sometimes occurring after even small doses. The diuretic influence of the drug, he says, is not of long duration, and he recommends it chiefly in ailments which have run their acute course, leaving œdema behind them, and in those where the mercurial itself is likely to exercise a beneficial effect, *e.g.*, in pleural exudations.

PREVENTION OF DIPHTHERIA.

A RECENT document issued by the State Board of Health of Michigan is, in its few brief paragraphs, the most eloquent plea we have ever seen for the establishment and maintenance of Boards of Health, and shows that when this department of the Public Service is properly organized with suitable *personnel*, and clothed with sufficient power, it is capable of saving numerous lives.

During the year 1886 there occurred in the State of Michigan 461 outbreaks of diphtheria. Of 243 of these outbreaks there is no clear record as to an attempt to restrain the spread of the disease by isolation or disinfection. Of the remaining 228 outbreaks the statements are clear. In 102 outbreaks no attempt was made either to isolate the earlier patients or to disinfect the apartments or surroundings; the result was that there were 1650 cases of the disease, with 329 deaths, or an average of 16.18 cases and 3.23 deaths to each outbreak. In 116 outbreaks isolation and disinfection were both more or less rigidly enforced; the result was that there were only 332 cases and 77 deaths, or an

average of 2.86 cases and 0.66 deaths to each outbreak. According to these figures nearly 1500 cases of diphtheria and 300 deaths were prevented by the local Boards of Health.

THE INDEX MEDICUS.

WHEN Mr. George S. Davis, after the failure of the firm of George P. Leypoldt to put the *Index Medicus* upon a sustaining basis, undertook the publication of this work, we spoke earnest words of commendation, and urgently solicited support for the enterprise from our readers. It is, therefore, with great pleasure that we note the passage of the following resolutions at the recent meeting of the Tennessee State Medical Society in Nashville:

"WHEREAS, The medical profession of this country has for years taken a great interest in the permanent establishment of the *Index Medicus*, first published by Leypoldt, of New York City, in 18—; and

"WHEREAS, By the death of this public-spirited friend of science and literature the current cyclopædia book of reference was *in articulo mortis;* and

"WHEREAS, Mr. Geo. S. Davis, secretary of the firm of Parke, Davis & Co., Detroit, Mich., at the earnest solicitation of medical editors and writers in all parts of the world, undertook to keep it alive; therefore, be it

"*Resolved*, That the Medical Society of the State of Tennessee do hereby express its high appreciation of this liberal aid given investigators everywhere, and earnestly hope the profession will not allow the final effort to maintain a great periodical which has reflected special credit on American medical science to fail because of indifferent and niggard support."

Reports on Therapeutic Progress.

THE TREATMENT OF LUPUS.

At a recent meeting of the Nottingham Medico-Chirurgical Society, MR. CHICKEN (*Lancet*, April 23, 1887) read a paper on the "Treatment of Lupus and its Allied Disorders." He took epithelioma as a type of the diseases allied to lupus as exhibiting a cutaneous or mucous cell development, infiltrating or penetrating subjacent tissues, and depending on a specific morbid impulse. In the case of an affection of the skin, or those parts which could be safely operated upon, he advocated the treatment of the part by thoroughly scraping away, as far as possible, the new growths, and then the free rubbing in of iodoform. In those instances where the situation was such that this could not be done,—as, for example, in epithelioma of the cervix uteri,—he employed the frequent application of iodoform. Although, in these difficult cases, it was not possible to eradicate the disease, it modified the subsequent progress and unpleasantness of the malady in a marked degree. In epithelial stricture of the rectum, he first washed out the bowel with warm water, and then injected into the stricture from two to four drachms of iodoform daily by means of a special insufflator. In exposed situations, where the treatment could be thoroughly carried out, the result was very satisfactory. He showed two cases, one of lupus and one of epithelioma, both of which had been operated upon in the manner described, some years ago. There had been no recurrence. Mr. Chicken drew the following conclusions: 1. That lupus and epitheliomata are types of a cellular infiltrating new growth, and are best treated by scraping with a blunt knife, and when the surface has been as far as possible cleared from the invading cells, by rubbing in a remedy, of which iodoform is a good example, with the object of penetrating to those outlying detachments which the knife has not reached. 2. That when the growth is situated in a part that can be readily attacked the treatment gives ground for a good hope of recovery, at any rate better than excision. 3. That when the situation is such that scraping cannot easily be done, the copious insufflation of large quantities of iodoform is practically without risk and of great benefit to the condition of the patient. 4. Iodoform is specially applicable, because it seems to exert a specially sterilizing influence on the growth, and is capable (by virtue of its volatile and peculiar penetrating properties) of permeating tissue more than an insoluble non-volatile substance. It is quite harmless and unirritating to healthy structures.

ELECTRICITY DURING AND AFTER LABOR.

There are probably very few complaints and infirmities for which electricity in one form or another has not been tried, with varying success, it is true, but this uncertainty in its effects is attributable not only to the greater or less appropriateness of its employment,

but also to the greater or less manipulative dexterity of the person using it. A case is reported in a French medical journal in which its application both for the purpose of stimulating labor, and subsequently for cutting short an attack of violent post-partum hemorrhage, was attended with great success. When the flooding began, the removal of the clots with internal manipulation of the uterus, together with injections of vinegar and hot water, were tried, but failed to excite uterine contraction. The medical attendant then took advantage of the proximity of a strong battery to cut short the attack. He placed one pole in the hand of the patient, and took hold of the other himself. With his disengaged hand he grasped the uterus through the abdominal walls. The experiment was a disagreeable one for the doctor, but he had the satisfaction of seeing the uterus contract promptly and firmly, and the hemorrhage ceased. It is, of course, impossible to affirm that the result in this case was due directly, and only, to the stimulus of the current, but there is every reason to believe that the effect of a strong and interrupted current on the muscular fibres of the uterus would be likely to favor such a result. The experiment is certainly one worth repeating, and we would commend it to the attention more particularly of lying-in institutions, where it would not be difficult to arrange for a suitable apparatus being kept ready for immediate use. In private practice, too, in cases where flooding for some reason or another is feared, it would be well for the practitioner to provide himself with the necessary paraphernalia, since no agent which offers any resource against such a terrible enemy as post-partum hemorrhage is to be neglected in these cases.—*Medical Press*, April 13, 1887.

ANTIPYRIN AS AN ANODYNE.

According to the Paris correspondent of the *London Lancet*, April 30, 1887, at a recent meeting of the Academy of Sciences, PROFESSOR GERMAIN SÉE made a communication upon "The Treatment of Pain by Antipyrin." This substance, which was discovered by Knorr in 1884, was first employed, as its name implies, for lowering the temperature, and it was expected that it would prove useful in typhoid fever, articular rheumatism, and other acute affections. It has not, however, been as satisfactory in its action as was anticipated, and if the temperature can be by its use lowered at will, it does not seem to exercise much effect upon the process of disease. But according to M. Germain Sée, antipyrin is the remedy, *par excellence*, for pain, and far superior in every way to antifebrin. In fifteen cases of subacute rheumatism, or hydrarthrosis, treated unsuccessfully by salicylate of soda and ignipuncture, the pain and swelling disappeared in a few days, and, the medicine being continued, there was no relapse. The same effect was observed in cases of acute gout, both primary and secondary to chronic gout with chalky deposits. Antipyrin, to the extent of from 60 grains to 90 grains a day, removed both pain and swelling in from two to four days without any bad effect either on the heart or kidneys. But it is, above all, in nervous pain that its action is most remarkable. A first group comprises four cases of facial neuralgia, one of which was inveterate, six of migraine, with one failure, and four headaches. In a second series are classed five cases of sciatica, one of simple neuritis, two of diabetic neuritis, and two of neuritis with zona (one failure). Cases of lumbago and muscular rheumatism make up a total of eighteen. The third category relates to five cases of locomotor ataxia, in four of which the pains were removed by antipyrin. In the fifth instance it failed, as did also antifebrin. The last group comprehends those affections of the heart, aorta, and coronary arteries in which angina is a most painful symptom. In six patients with cardio-aortic disease, and in three others with aneurism, the painful manifestations disappeared entirely, without any evil effect being caused by the medicine on the strength or regularity of the cardiac pulsations. The dose given by M. Sée is from 3 to 6 grammes daily. If too much is given at one time, nausea and giddiness may supervene, but when the whole amount is divided into small repeated doses of half a gramme, no disagreeable effects are observed. Antipyrin may be given and continued for a length of time with but little risk. Antifebrin, on the other hand, is dangerous when administered in doses exceeding 1 gramme. It causes hæmoglobin to pass into the condition known as metahæmoglobin, and the blood, losing part of its oxygen, becomes of a chocolate color, cyanosis and collapse being the consequences. From laboratory experiments it is found that reflex excitability to electricity is diminished by antipyrin, and the sensory perceptivity of the cord is lessened.

NARCEINE.

Some experiments made by M. LABORDE with narceine specially prepared by M. Duquesnel, so as to be free from morphine and codeine, appear to have given results varying considerably from those obtained on previous occasions with what may be presumed to have been less pure preparations. M. Laborde states (*Archives de Pharm.*, April 5, p. 183) that he found this narceine much more active than any he had used before. A dose of 2 centigrammes caused the disappearance of insomnia in an adult, and in case of acute or chronic catarrhal bronchitis it rapidly relieved the cough. The quantity administered can be carried to 4 centigrammes, but it should be given in fractions of a centigramme at a time. It also soothes the paroxysms of whooping-cough in children, and M. Laborde recommends its administration for this purpose in a teaspoonful dose containing ¼ of a centigramme of narceine. Its effect when injected subcutaneously into dogs, in quantities of 1 to 3 centigrammes, is described as differing remarkably from that of morphine, the pure narceine producing a quiet, natural sleep, whilst with morphine there is considerable disturbance.—*Pharmaceutical Journal and Transactions*, April 30, 1887.

THE DIFFICULTIES IN ESTABLISHING NATURAL RESPIRATION AFTER TRACHEOTOMY, AND THEIR TREATMENT BY TRACHEAL CATHETERIZATION.

At a recent meeting of the Clinical Society of London, MR. BILTON POLLARD referred to three cases illustrating the difficulties in establishing natural respiration after tracheotomy, and drew attention to their treatment by tracheal catheterism (*Lancet*, April 30, 1887). The difficulty in getting rid of the tube after tracheotomy was by no means uncommon, and in two of the cases related it persisted after most determined and persevering attempts had been made for more than a year and a half by the usual methods. Two of the cases had been for a long time under the care of Mr. Godlee, and had passed into Mr. Pollard's hands when he succeeded Mr. Godlee at the Northeastern Hospital for Children. The first case was a boy aged two and a half years, on whom tracheotomy had been performed for laryngitis. For eight months frequent attempts were made to dispense with the tube. Mr. Godlee then catheterized the larynx without benefit. Five and a half months later a piece of india-rubber tubing was passed through the larynx from the mouth to the tracheotomy wound, and left in position for forty-eight hours, without any improvement in laryngeal respiration. The operation was repeated four months later without success. A year and seven months after the tracheotomy Mr. Pollard passed a tracheal catheter from the mouth through the glottis and into the trachea, beyond the tracheotomy opening. It was retained for thirty-one hours, and after its removal the patient continued to breathe through his mouth. The tracheotomy wound was firmly healed in a fortnight, and the child had been perfectly well for the six months that had passed since the operation. In the second case (a boy aged 6) the windpipe had been opened for laryngitis. Three months after the operation, all attempts to get rid of the tube having failed, Mr. Pollard passed the tracheal catheter, and in doing so dislodged a piece of granulative tissue, which was coughed up. Pneumonia followed in this case, but the patient was nevertheless cured, and was discharged a fortnight after the operation. He remained perfectly well for the three months that had passed since the operation. In the third case (a boy aged 4) the operation had been performed for impaction of a foreign body in the right bronchus. For seven months attempts were made to get rid of the tube. Mr. Godlee then removed granulative tissue from the trachea and catheterized the larynx. The latter procedure was frequently repeated during the next three and a half months. Two years and three months after the tracheotomy Mr Pollard found the vocal cords adherent; he separated them, and, after dilating the glottis with Lister's sounds, passed the tracheal catheter, which was kept in position for thirty-eight hours. It was not until three weeks after this operation that the patient breathed through his mouth alone. The boy's voice returned, but after four weeks laryngeal respiration was so difficult, owing to the vocal cords having grown together again, that the trachea had to be reopened. The only difference between the plan Mr. Pollard followed and that which Mr. Godlee adopted was that, by keeping the tube in the trachea whilst the tracheotomy wound was allowed to close, the patients were left, on its removal, without the opportunity of making use of the passage which, from constant employment, had become for them the natural one. In the first and second cases the chief cause of ob-

struction was laryngeal spasm, but in the second there was also a growth of granulative tissue. In the third case there was a genuine stricture of the larynx, and the tracheal catheter served as a means of continuous dilatation; the result in this case showed that the dilatation should have been employed for a longer period. In two of the cases the tracheotomy incision had divided the cricoid cartilage, and Mr. Pollard suggested that this method of operating might be a cause of the difficulty of re-establishing laryngeal respiration in those cases.

Mr. Howard Marsh thought that in performing tracheotomy it should not be forgotten that the trachea was a canal, like the urethra, lined by delicate mucous membrane. Ulceration and granulation-tissues were frequently developed under the influence of the mechanical irritation of the tracheotomy tube. The fenestra in the tube was often the offending point, and when situated posteriorly then a hernial-like protrusion of the posterior wall might become the seat of granulations. He advocated the use of tracheotomy tubes with movable necks, and with a round, not bivalve, body. The surgeon should have an assortment of tubes to fit different cases, for in some the neck was very shallow, in others very deep, and so forth. He doubted whether all the cases could be successfully treated as Mr. Pollard's, and related a case in which no lumen through the larynx, which was full of granulation-tissue, could be detected on examination. Such a case was likely to prove hopeless under any method of treatment. The lapse of time was an important item in the cure of such cases, for cicatrization might occur meanwhile, and the natural growth and enlargement of the respiratory passages would come into operation. He mentioned a case of stricture of the trachea from permanent contraction which occurred in a child, now a woman, aged 25, but without any recovery of breathing power.

Mr. C. H. Golding-Bird considered that Mr. Marsh exaggerated a little the harm done by the fenestra in the tracheal tube. The permanent rough edge of the two-bladed tube was very deleterious. At the present time he had two cases under his care in which the children ceased to breathe on removal of the tube. In these the conditions were probably the same as those he had described in 1885. The edges of the tracheotomy wound were grown upon by granulation-tissue. In one case a growth of granulations existed on the posterior surface of the trachea, and this was removed by Toynbee's ear forceps. He did not think the tube would account either for the absence or presence of granulations. A phlegmonous inflammation occurred in some cases, but he could not say whether this had any share in the causation of the granulations. In many the muscles of the larynx wanted treatment, and he thought that catheterization, which he had practised for some years past, might act by rousing the muscles into proper action.

Mr. R. W. Parker recognized two classes of cases: those with and those without mechanical obstruction. The former far outnumbered the latter. Treatment by catheterization for the cases of mechanical difficulty would not always prove successful. Thickening of the mucous membrane of the pharynx and aryepiglottic folds was an important condition not sufficiently recognized. In the second case he believed that the catheterization proved dangerous by detaching granulations.

In some patients the difficulty remained because the surgeon delayed too long the attempt to remove the tracheotomy tube. He agreed with Mr. Marsh that the tube should be fitted to the case, for the variety in size of the neck, trachea, and child was great. He believed that treatment was not yet entirely successful. Reference was made to a case under his care in a child aged 2 years, who had scalded his glottis, but for whom little could be done at present, though doubtless time would prove of great service, as it had done, in his opinion, in Mr. Pollard's case, for the larynx remained small till about the age of twelve or thirteen, when an extra development occurred, especially in the male sex.

Mr. Bilton Pollard, in reply, could not agree that the pneumonia was due to the trickling down of blood, but believed that it was due to collapse of the left lung, owing to the direction of the tube, which perhaps permitted air only to enter the right lung, for there were no breath-sounds on the left side of the chest whilst the tube was in. The further progress of the third case was not altogether unsuccessful; many granulations about the vocal cords had by treatment developed into cicatricial tissue, there being a sufficient opening through the larynx to permit of breathing for as long as twenty-four hours, when the tracheal tube had to be replaced, apparently because mucus in the trachea became excessive, and the child had difficulty in coughing this up.

IODOL.

SEIFERT reports his experience with iodol in the treatment of laryngeal tuberculosis, and was much pleased with his results. At first he used a mixture of iodol and starch, but when he found that iodol alone produced little or no irritation, the drug was used alone. The patients bore the insufflation of the powder extremely well. The loss of appetite, so commonly seen after the use of iodoform, did not occur, the ulcers rapidly became clean, and the tendency to form scars was scarcely observed. In the case of a man, aged 35, a tuberculous ulceration of the right vocal cord was healed by creasote, glycerin, iodoform and boric acid; an ulcer of the left cord was healed by insufflation of iodoform, and the infiltration was removed by painting with lactic acid; and finally, six months later, a newly-formed tuberculous infiltration and ulceration of the left false cord was healed by insufflation of iodol.

In other diseases iodol was most acceptable because of its freedom from odor, non-irritability, lessening of secretion, and power of disinfection. He had also tried iodol in atrophic rhinitis, after the use of the galvanocautery in the nose and vaso-pharynx, in the treatment of syphilitic ulcers, round ulcers, suppurating buboes, and after opening the pustules of acne.

Internally, iodol was given in a case of substernal struma, 3 grains in pill form, with good results.

To observe the elimination of iodol the writer himself took 8 grains without bad effect.

Iodine appeared in the urine twelve hours after taking, and also in the saliva; the elimination was greatest eighteen hours after taking, and persisted three days.—*Centralb. für Chirurgie*, April 9, 1887.

TREATMENT OF DIABETES.

According to the Paris correspondent of the London *Lancet* (April 30, 1887), DR. LE BLOND makes known another "specific" treatment for diabetes, which, if not precisely new, is novel in its mode of application, and from which he has obtained some remarkable results. The administration of oxygen in the form of peroxide of hydrogen has often been tried, but, although it would seem theoretically to be the ideal treatment for glycosuria, results have not been sufficiently constant to popularize it. M. Le Blond has reopened the question, and advises the administration of an aerated water which has been manufactured in Paris for the last few years, and which only differs from the familiar *siphon* in that it is gaseous from oxygen instead of carbonic acid. Three cases are reported, in which the treatment caused the total disappearance of sugar from the urine; in a fourth the partial failure was due to imperfect oxidation from chronic bronchial catarrh.

BENZOYLTROPINE AS AN ANÆSTHETIC.

In a search made with the hope of finding some compound that might, like cocaine, possess anæsthetic properties hitherto unobserved, PROFESSOR FILEHNE was induced to turn his attention to the tropeines, atropine having been formerly regarded as a gently acting local narcotic (*Berl. Klin. Woch.*, No. 7; *Med. Rec.*, April, p. 136). By experiment atropine was found to have a slight but distinct paralyzing influence on the ends of the sensory nerves, whilst with homatropine this effect was very decided. Tracing some analogy between the splitting up of atropine into tropine and tropic acid, and that of cocaine into ecgonine, benzoic acid, and methylic alcohol, and ecgonine proving to be inert, Professor Filehne inferred that the anæsthetic property was conferred by the acid radicle. Moreover, he found confirmation of this inference in the fact that just as homatropine stands between atropine and cocaine in its anæsthetic property, amygdalic acid, the acid of homatropine, is in constitution intermediate between tropic and benzoic acids, the acids of atropine and cocaine respectively, as is shown by the following formula:

Benzoic acid, C_6H_5COOH;

Amygdalic acid, $C_6H_5CH<\begin{matrix}COOH\\OH\end{matrix}$;

Tropic acid, $C_6H_5CH<\begin{matrix}COOH\\CH_2OH\end{matrix}$.

Professor Filehne was, therefore, led to anticipate that the compound resulting from the union of benzoic acid with tropine would have a greater local anæsthetic effect than homatropine. This was fully confirmed by experiment, benzoyltropine proving to be a wonderful local anæsthetic, whilst when applied to the eyes it also exercised the action upon the pupils and accommodation characteristic of other tropeines. A number of "benzyl derivatives" were therefore tested, and all proved to produce a decided local

anæsthetic effect, benzylmethyltriacetonalkamine being the most powerful of those tried, benzyl-quinine came next, and the weakest was benzyl-morphine. This would seem to be a curious instance of a correct deduction being drawn from a false premise, for apparently, of all the compounds experimented with, cocaine was the one which told most strongly against the theory that the anæsthetic rôle is played by the benzoic radicle. If this assumption were correct, benzoyl-ecgonine should have anæsthetic properties, which is contrary to common experience with this decomposition product of cocaine. Dr. Stockman reports on benzoyl-ecgonine (*Pharm. Journ.*, (3) xvi. 898), "the chief action of cocaine, namely, the paralysis of the sensory nerves, is quite absent; in fact, the relationship between the two substances seems to be as profoundly altered by the subtraction of a methyl group as is the case with methylstrychnine and strychnine."—*Pharmaceutical Journal and Transactions*, April 30, 1887.

TREATMENT OF GRAVE EPISTAXIS.

According to the Paris correspondent of the London *Lancet* (April 30, 1887), M. Verneuil, who, although one of the most eminent surgeons, makes frequent incursions into the domain of pure medicine, read a communication at the Academy of Medicine upon the treatment of certain forms of epistaxis by counter-irritation over the region of the liver. M. Verneuil began by stating that he had at first thought that the method was entirely his own, but from bibliographical research it turned out that he had been anticipated to a certain extent by Galen, who says that large cupping-glasses applied to the hypochondria arrest nasal hemorrhage. In the first case related by M. Verneuil, the epistaxis was probably symptomatic of cirrhosis of the liver. Quinine, ergotine, and digitalis had all been tried in vain. The hemorrhage continued to recur at intervals. The second patient had suffered from nasal hemorrhage, which seemed to have been caused by the shock of a kick from a horse. In this case plugging had failed. The third was the subject of chronic nephritis, with secondary affections of the heart and liver, and the cavity of the nose had been plugged without effect both with ergotine and perchloride of iron. M. Verneuil's treatment, which was immediately and permanently efficacious, consisted of the application over the region of the liver of a large blister.

ANTIPYRIN IN MIGRAINE.

Antipyrin is best known for its rapid action in the treatment of pyrexia, and it is commencing to acquire a reputation in the treatment of neuralgia. Dr. T. S. Robinson states in the *Medical Record* for May 7, 1887, that he has a record of over eighty cases in which during the past two years antipyrin was used for the relief of migraine.

These cases are not selected. In fifty-four the drug acted favorably in from thirty minutes to two hours. In fifteen cases the pain was much abated, and when he resorted to chloral, bromides, or other drugs, he had to use smaller doses than the patient had otherwise been in the habit of taking. The relief was greater and the attacks generally cut short. In eight cases it had little or no effect. The reports from successful cases were all in favor of this drug, not only that it was quicker in its action, but that it did not leave the ill effects generally left by other forms of medication they had been in the habit of using. The usual narcotic treatment of migraine is generally hurtful, the patient being too ready, on the slightest symptom of pain, to fly to his favorite drug, many times establishing a habit which is worse than the original disease. This objection cannot be applied to antipyrin, as it neither narcotizes nor stimulates our patients.

He recommends that patients who are subject to attacks of hemicrania should keep powders of antipyrin of 22 grains each constantly on hand, and that on the first symptom of the attack one powder should be taken in a little Vichy water, and repeated in two hours if the pain is not abated.

THE ADMINISTRATION OF CARBONATE OF LIME AS A MEANS OF ARRESTING THE GROWTH OF CANCEROUS TUMORS.

Nearly twenty years ago Dr. Peter Hood published a communication on the value of carbonate of lime in the form of calcined oyster-shells as a means of arresting the growth of cancerous tumors. In the *Lancet* for May 7, 1887, he publishes a second communication on the same subject, in which he states that although his opportunities for employing it in suitable cases have not been large, the results which he has attained through its use have been extremely satisfactory. He refers to several cases in which a persevering use of the calcined shell powder

arrested the growth and pain in tumors undoubtedly of a cancerous character. Dr. Hood urges the persistent and fair trial of this remedy in cases of cancer, where the nature of the affection is early recognized. It can do no possible harm, it need not interfere with other remedies for the relief of pain, its action can be referred to an intelligible and probable hypothesis, and it has been of utility in a sufficient number of cases for warranting us in reposing some confidence in its use.

An advantage of the treatment is that it may be readily prepared at home by baking oyster-shells in an oven, and then scraping off the calcined white lining of the concave shell. The substance thus obtained is to be reduced to a powder, and as much as will lie on a silver quarter taken once or twice a day in a little warm water or tea.

A SIMPLE METHOD OF OPERATION FOR DIVERGENT SQUINT.

Readjustment of the insertion of the internal rectus is now a recognized surgical procedure. It is therefore important that the operation should not only be effectual, but easy of performance and as simple as possible. Since its introduction it has undergone various modifications and is still a very tedious procedure, necessitating the use of an anæsthetic, during the administration of which the patient not infrequently vomits, and matters are thus greatly complicated. The introduction of cocaine has to some extent lessened these inconveniences, but has scarcely enabled us to dispense with the use of an anæsthetic in operations involving the deeper structures.

Mr. Richard Williams (*British Medical Journal*, April 23, 1887) recommends the following method as one which will in most cases not require the use of an anæsthetic, and in which the time of the operation may be greatly shortened :

An incision is made in the conjunctiva and subconjunctival tissue over the tendon of the internal rectus, extending from near the margin of the cornea for about half an inch towards the inner canthus. The edges of this incision being separated, the strabismus hook is inserted under the tendon in the usual way, and then confided to an assistant. A curved needle armed with a suitable silk thread is then inserted in the conjunctiva near the margin of the cornea, and carried between the sclerotic and the conjunctiva towards the muscle behind the hook. It is then passed through the tendon from edge to edge at right angles to the course of its fibres, and brought out at the opposite side of the conjunctival wound. The edge of the conjunctiva at this side of the incision is now raised with a pair of forceps, the needle is insinuated between it and the sclerotic, and brought out near the margin of the cornea at a point corresponding to the point of entrance. It will be seen that the tendon and conjunctiva are included in a single loop. At this juncture the external rectus may be divided or not, according to the requirements of each individual case. This point having been disposed of, the tendon of the internal rectus is divided at a safe distance from the ligature, and the hook is removed. By now tying the two ends of the loop together, the margin of the cornea is brought into apposition with the cut end of the tendon, and the eye is brought into a position of more or less internal squint. Finally, the edges of the conjunctival incision are brought together by means of a fine suture.

The advantages claimed for this operation are : (1) that it is much shorter and simpler than the usual method ; (2) that by passing the ligature in the manner described a very firm hold is obtained both of the tendon and the conjunctiva, which is sometimes apt to tear ; (3) that no anæsthetic is generally required. The objection which naturally suggests itself is that there is a certain amount of tendency to puckering of the end of the tendon where the loop is tied. It would appear, however, this objection is more theoretical than real ; at any rate, Mr. Williams has not found that it jeopardized the success of the operation in any of his cases. Moreover, it can to a large extent be avoided by placing the points of entrance and exit of the ligature at a considerable distance from each other.

HUAMANRIPA.

A Chilian plant, called by the natives huamanripa, has recently been reported on by M. Bignon, of Lima, who says that it possesses a deserved reputation as a specific in all diseases of the respiratory tract. It grows only on the slopes of the Cordilleras at a considerable height, and is a small composite plant belonging to the genus Cryptochoete. It has long lanceolate leaves, and flourishes from January to May, after which it disappears, although the rhizome remains. It is said to

be very aromatic and resinous. An infusion is used, made from twenty-five grammes of the leaves to a litre of water, which is bitter and aromatic; if made of greater strength it causes nausea. According to DR. ZAPATER, the infusion increases the circulation, accelerates the cardiac movements, and augments the secretions, especially the flow of saliva. In larger doses it causes vomiting, excessive perspiration, diminishes the number of pulsations as well as the respiratory movements, and lowers the temperature. In pleurisy and inflammation of the lungs it seems to have almost a specific effect, according to Dr. Zapater. When it is desired to prevent nausea, a little brandy is given with the infusion.—*Pharmaceutical Journal and Transactions*, April 30, 1887.

THE TREATMENT OF INTRA-PERITONEAL INJURIES.

Abdominal section for the treatment of intra-peritoneal injuries was made the subject of an address delivered by SIR WILLIAM MACCORMACK before the Medical Society of London at its meeting held May 7, 1887 (London *Lancet*, May 7, 1887). The text of the speaker's address was founded on his experience in the treatment of two cases of intra-peritoneal rupture of the bladder produced by external violence. In both of these cases the abdominal cavity was laid freely open, the rent in the bladder closed by suture, and the peritoneal cavity effectually purified. In each instance the patient completely recovered, and two men, the subjects of a heretofore fatal injury, were restored to perfect health.

Injuries of the abdominal viscera may be grouped under three heads,—first, incised penetrating wounds of the abdomen implicating the intestine or other viscera; second, abdominal gunshot wounds; and, third, traumatic rupture of the intestine and viscera without external wound. Of course the great difficulty that besets the surgeon in the management of such injuries is that of diagnosis. These lesions are almost invariably fatal, and the very difficulty of diagnosis imposes upon the surgeon the necessity for clearing up the doubt as to what the nature of the injury may be. It is, therefore, now almost universally recognized that the duty of the surgeon is to explore, first, the wound of the parietes, if such be profound, to see whether it is perforated or not; and, second, examine the abdominal viscera through an exploratory incision to see whether and where they are injured. Such a treatment is now not only justifiable, but it even may be claimed that a surgeon who, called to an obscure case of severe abdominal injury, or to a penetrating wound of whatever kind of the abdominal viscera, neglects this preliminary operation, is throwing away one of the chances which might have existed for saving his patient's life. An intestinal wound having been discovered, the proper line of treatment undoubtedly is to close it with the utmost care by the Lembert suture, as the one preferred by Sir William MacCormack, after having cleansed the peritoneum and closed the external wound. Already the statistics of the treatment of such cases have shown a successful result in ten out of eighteen stab wounds, while in thirty cases of penetrating gunshot wounds seven have been saved.

In the application of the intestinal suture three conditions are required to insure its successful application,—first, two adequately broad and sufficiently wide surfaces of the peritoneum must be brought into contact; second, the mucous membrane must be excluded, for when the needle passes through the whole thickness of the gut, peritonitis generally ensues from leakage taking place along the line of the thread; third, rapidity of execution is of extreme importance, and that form of suture is the best which can be effectually applied in the shortest time.

In the case of incised wounds of the intestine, if small and if clean cut, the edges of the incision may themselves be sutured together, and where rupture has occurred, or in the case of gunshot wounds in which the intestine is perforated at more than one point, excision of the injured locality is nearly always required. In the case of rupture of the intestine without external wound, exact diagnosis is almost always impossible, and the chief indications for operative interference are varied by the mode of action and the severity of the violence, and the presence of prolonged and profound shock. The duration of the shock is of greater importance than its intensity. A small and quick pulse and hurried respiration, while the temperature remains either normal or subnormal, associated with acutely severe, persistent, and localized pain, increased on pressure, indicate the serious nature of the injury. Bloody vomit or stool, rapid tympany, the evidence of percussion, are inconstant signs, and help us but little. The jejunum and ileum are the portions of intestine most frequently ruptured, and the rent will generally be found just behind the part of the abdomen which has been

struck,—a fact which can easily be verified by experiment. In about fifteen per cent. of the cases more than one loop of intestine is damaged, and in that case the injury generally occurs in superimposed coils. It is difficult at first to distinguish the syncope induced by hemorrhage from the shock caused by a ruptured intestine. In the early period we shall have to arrive at a diagnosis from the nature and violence of the injury and the general condition of the patient. When peritonitis is declared, an exploratory operation is urgently indicated, as collapse comes on very quickly, sometimes very suddenly, and a few hours' delay may negative all prospect of recovery.

Absolute rest has hitherto been the chief indication for treatment. But cases do arise in which abdominal section should be practised, and an attempt made to discover and deal with the visceral wound, arrest the bleeding, and clear away the clots and extravasated blood. We should interfere when we possess a reasonable belief that the intestine is ruptured. We may in some cases properly propose laparotomy as a means of diagnosis, and, indeed, when intestinal rupture is suspected, the operation should be performed at once to afford a good prospect of success. Exploratory laparotomy has no very serious inconvenience, and should be adopted in those cases where there are reasonable grounds for believing the intestine has been damaged, as in no other way can effective assistance be rendered to the patient. At a later period we have not only the ruptured intestine to deal with, but a septic peritonitis, which produces the most profound depression, and often necessitates an undue curtailment of some essential step in the operation, or occasions the death of the patient before its completion. Extreme collapse, a long interval from the time of the injury, or severe coexisting damage to the spleen, liver, or pancreas, of course contraindicate operation. The incision should be made in the middle line in all cases, and at the level which will afford readiest access to the seat of the injury. It is desirable to make it long enough to permit the surgeon to reach without difficulty every part of the interior. According to circumstances, we may then decide to suture the intestinal wound, resect the injured portion of the bowel, or make an artificial anus. The same objections hold in regard to the latter that obtain in respect of artificial anus after gunshot injury. Where it is at all practicable, it is best to finally close the opening in the intestine and also the external wound.

THE ADVANTAGES OF ANTIFEBRIN.

Mr. J. K. Murray recommends antifebrin as possessing advantages over other antipyretics on the following grounds (*British Medical Journal*, April 23, 1887):

Antifebrin seems much more powerful than quinine, kairin, or antipyrin. It equals antipyrin in the duration of its effects, and in this respect surpasses quinine or kairin. It is only excelled in the quickness of its action by the external application of cold. Its effects are evident within an hour, and they last from ten to twelve hours when a full dose has been administered. When administered for a long time, the dose must be increased. It produces profuse sweating and redness of the cheeks; it diminishes the pulse-rate, and distinctly increases arterial tension. He found no depressing effects follow its administration, even when full doses were given. Antipyretics belong to two great classes,—namely, those which diminish tissue-metabolism; and, secondly, those which increase the loss of heat. From the sweating it produces and the rise in arterial tension, one might conclude that antifebrin belongs to the second class as well as to the first one. This might explain the quickness of its action, as antipyretics of the second class act more speedily than those which diminish tissue-metabolism.

KÉFIR.

We take from *Le Pratique Médicale*, No. 10, the following account of the preparation and use of this beverage, which in some respects is much like koumiss.

It can be made from the milk of different animals, but it is generally made from cow's milk. Fermentation is excited by the presence of the kéfir, which is a species of mushroom, white when fresh, and yellow when old and dry, compact, elastic, and about one-fiftieth of an inch in diameter.

Chemically it is composed of water, fat, peptone, and nitrogenous material.

Examined microscopically it is composed of the rods and cells of beer-yeast.

It is found in the mountains of northern Caucasus near the snows. The natives believe that it is produced by the bushes which grow upon the mountain-tops. It is probable that the first origin is in the great number of bacteria which circulate in the atmosphere, and whose soil of development is furnished by the curds of coagulated milk.

At the beginning of the preparation of

kéfir the grains should be allowed to swell in tepid water for five or six hours,—2 teaspoonfuls to a tablespoonful of kéfir grains; they should then be washed in cold water and put in half a glass of fresh milk, which is changed every three hours. The grains, which were yellow, become white, and are then ready for the preparation of kéfir.

This is done by placing the white grains in a quart of fresh cow's milk, and the whole placed in uncorked bottles and exposed to a temperature of about 45° F., and frequently shaken. The milk begins to ferment soon, and in seven or eight hours the mass is fermented. The kéfir grains are removed by filtering through muslin, the liquid replaced in bottles, which are only partly filled, and carefully corked.

The milk is left at a constant temperature, and shaken every two or three hours. Fermentation continues in spite of the absence of the ferment, and in twenty-four hours the drink is ready. The grains of kéfir may be washed and used indefinitely.

Kéfir is richer in albumen than koumiss, less alcoholic, and less acid.

The following table of analysis shows the composition of milk, koumiss, and kéfir:

	Cow's milk.	Koumiss.	Kéfir.
Albumen	48	11.2	38
Butter	38	20.5	20
Sugar of milk	41	22.	20
Lactic acid	—	11.5	9
Alcohol	—	16.5	8
Water and salts	873	918.3	905

SULPHATE OF SPARTEINE.

M. MASIUS, of Brussels, having been engaged in investigating the physiological effects of sulphate of sparteine, has come to the following conclusions: 1. In small doses it does not modify the carotid pulsations in dogs. 2. In moderate doses it diminishes the irritability of the pneumogastric, accelerates the pulsations, which decrease in amplitude, and at the same time suppresses the periodical respiratory variations. 3. In poisonous doses it induces paralysis of the pneumogastric, also asphyxia, and, as a consequence of asphyxia, a change in the pulsations, which become larger and less rapid, and then quickly smaller and smaller, till they take on the characters of "alternate pulse," and finally cease. 4. The blood-pressure decreases only a short time before death. 5. It exerts in the healthy subject no effect on the urinary secretion. 6. In disease its effect on the heart is uncertain, as well as its effects on the urinary function and on the subjective condition of the patient. —*The Lancet*, May 7, 1887.

THE EXPLORATION OF THE BLADDER BY THE SUPRA-PUBIC METHOD.

At a recent meeting of the American Surgical Association, DR. F. S. DENNIS read a paper on the above subject. He said the supra-pubic operation of to-day is practically the same as the old operation: the only change has been an improvement in *technique*. The first reported operation was that of Franco, in 1561. From that period to 1879 cases were not numerous, but from 1879 to the present time the operation has been done with such success as to attract attention throughout the world. The time is not far distant when practically the only two operations for vesical calculus will be supra-pubic lithotomy and litholapaxy. Supra-pubic lithotomy is simple in *technique*, safe in execution, free from injury to the reproductive organs, radical in results, curative in application, and brilliant in statistics. The many serious accidents attending the lateral operation are entirely avoided.

Technique of Operation.—For a few days before operation a milk diet should be employed. The day previous to operation the bowels should be moved with castor oil, and on the morning of the operation an enema should be used so as to empty the rectum for the introduction of the rubber bag, and the abdomen should be washed with an antiseptic solution. After the patient has been etherized, the surgeon should introduce a rubber bag into the rectum, above the internal sphincter, into which twelve ounces of warm water are to be introduced. This quantity will have to be increased or diminished according to circumstances. The danger of rupture of the rectum in elderly people and in young boys should be borne in mind. The urine should be withdrawn, and six ounces, more or less, of an antiseptic solution introduced into the bladder. The catheter may be left in the bladder and stopped with cork, and this will serve as a guide to cut upon. The distention of the rectum and bladder increases the distance from the pubes to the anterior cul-de-sac of the peritoneum to three inches. The incision should be made in the median line, and should extend for three or four inches above the pubes. When the transversalis fascia is reached, the use of retractors (on the principle of the eye-speculum) facilitates the operation. Having divided the

fascia, the end of the catheter can be felt and cut upon as a guide. The bladder may then be seized with two tenacula and opened. Where free exploration is desired, sutures are introduced on each side of the incision. The stone is removed either with the fingers or forceps. The bladder may then be washed out. A catheter should be introduced through the urethra, but not left longer than twenty-four hours, on account of the danger of exciting traumatic urethritis. In most instances the wound of the bladder should be left open. In cases of calculi the condition of the vesical tissues is such that primary union is unlikely. In certain other conditions, such as rupture, the wound may be closed, for here the condition is different. The abdominal opening is to be closed and a tube introduced.

The operation is indicated (1) for hard, large calculi, and in persons suffering with paraplegia and deformities rendering lateral lithotomy difficult; (2) for removal of certain foreign bodies, such as hair-pins, etc., or for the treatment of chronic cystitis; (3) in cases of tight stricture, fibroma of prostate, tumors of the bladder; and (4) for rupture. In its extraordinary simplicity, its reduced mortality, its freedom from danger, and its safety for the general practitioner, it compares well with litholapaxy.

The speaker had collected one hundred and twenty-four cases of supra-pubic operation for stone done since 1879. Previous to this date the rate of mortality was thirty per cent. Since then the mortality has been reduced, there being eighteen deaths, a mortality of fourteen per cent. Seven of these deaths may be justly excluded, giving a mortality of nine per cent. According to Sir Henry Thompson's statistics, the death-rate from the lateral operation is twelve per cent.; according to the same authority, the mortality of lithotomy is six per cent. In considering the mortality of this operation, two facts are to be considered. The mortality may be improved by more rigid antiseptic precautions. The second fact is that the operation has been limited to the largest stones. When the smaller stones are included the death-rate will be reduced.

Specimens and models showing the position of the bladder under various conditions were then shown.—*Phila. Medical Times*, May 28, 1887.

CARBOLATE OF MERCURY IN SYPHILIS.

Dr. Karl Shadek, of Kieff, being anxious to try the effects of carbolate of mercury, which has been strongly recommended in syphilis by Professor Gamberini, requested M. H. Brandt, a pharmacist in Kieff, to prepare some for clinical use. This he did by precipitating a very dilute solution of bichloride of mercury with a concentrated alcoholic solution of carbolate of potassium. A yellowish precipitate was obtained, which, after being frequently agitated with the liquid for twenty-four hours, assumed a whitish appearance. It was filtered and washed with distilled water till the washings showed no traces of chloride. It was then transferred to a fresh filter-paper and dried under a bell-jar. In this way a nearly white, tasteless, amorphous substance was obtained, which was scarcely acted upon or dissolved by cold, but was readily soluble in boiling hydrochloric acid. The name given to it by Dr. Shadek is "hydrargyrum carbolicum oxydatum," and he has been using it in his private practice for several months. At first he gave it in the form of pills, one of which, containing about an eighth of a grain, was ordered three, or occasionally four, times a day. It was well borne, and did not interfere with the digestion. In some cases the treatment was continued for six or eight weeks, without producing colic or other disagreeable symptoms. The total number of syphilitic cases in which it was given internally was thirty-five (twenty-six men, six women, and three young children). In five of these there was swelling of the gums and salivation. Mercury was found in the urine after the third dose. Its therapeutic value was especially remarkable in macular and tubercular syphilides and in syphilitic psoriasis of the palm and the sole. Syphilitic rash and slight relapsing forms yielded to the treatment in from two to four weeks; in syphilitic affections of the mucous membrane, and in papular and pustular eruptions, from four to six weeks were required. Multiple enlargements of glands were but little affected by it. In the case of children from two to four years old, doses of about the fifteenth of a grain were well borne twice a day.—*The Lancet*, May 7, 1887.

THE TOPICAL TREATMENT OF TUBERCULAR PHTHISIS.

The researches of Koch and others demonstrate that bacilli are found in larger or smaller numbers in all forms of tuberculosis, and further, that some idea of the extent of the phthisical process may be determined

from the number of bacilli. It was found that the bacilli are more abundant where there was recent caseous infiltration, and in the interior of cavities whose walls were undergoing rapid softening. When the walls of the cavities are firm and indurated the bacilli are few in number, and they are fewest in the cicatricial contracting and pigmented lung-tissue. By examining the sputa of the phthisical patient much light may be thrown on the condition of the lungs. We may surmise that the fewer the bacilli the less the destruction, and *vice versa*. If we admit that bacilli are the cause of tuberculosis, bacillicides are naturally indicated. The experience of various physicians of the favorable results obtained from the use of bacillicides at any rate warrants their employment, even though they may not admit that the bacilli are the causation of the disease. Many bacillicides have been recommended; among them is corrosive sublimate, and this DR. J. L. PORTEOUS (*Edinburgh Medical Journal*, May, 1887) in his experience has found to be the best.

Various modes have been suggested for applying the remedies; inhalation of the spray containing the bacillicide being the most effectual, as it gets directly to the part affected and retains the original strength of the solution.

The method which Dr. Porteous employs is to use a spray-producer with a reservoir graduated to hold the exact quantity to be inhaled at one sitting. The patient is then directed to deeply inspire at the same time that the ball of the vaporizer is squeezed. By this means the vapor is drawn directly into the lungs and is in no way diluted before reaching the part affected. This process is repeated every four or six hours. Dr. Porteous reports three cases in which extremely favorable results followed this method of treatment.

THE PHYSIOLOGICAL ACTION OF HYDROCHLORATE OF HYOSCINE.

At a recent meeting of the Biological Society, M. GLEY communicated the results of his experiments on the physiological action of hydrochlorate of hyoscine. A minim of a one per cent. solution of this substance, when dropped into the eye of a dog or rabbit, produced in seven or eight minutes a marked dilatation of the pupil. In man the dilatation of the pupil and the paralysis of accommodation remained nearly five days after the application of one single drop of a one per cent. solution of hyoscine. The other eye, contrary to what took place in the rabbit, was in no way influenced by the drug. M. Gley recommends the drug on account of the rapidity of its action and its feeble toxic effects; fifteen centigrammes of hyoscine, injected under the skin of a dog, produced no serious accident. —*The London Medical Record*, May 16, 1887.

COLLAPSE FOLLOWING STRAPPING OF THE TESTICLES.

Strapping of the testicles after the evacuation of hydrocele fluids is a procedure which is frequently employed, but which from a case recorded by DR. J. SMYTH in the *Indian Medical Gazette* for January, 1887, is not entirely free from risk.

Dr. Smyth relates the case of a young man in whom the testicle was lightly strapped and supported after evacuation of the hydrocele. The next day the patient continued well, and as the strapping caused no discomfort the operation was repeated on the right side, which was strapped like the left. The next morning the patient was found in a state of collapse, able to speak only in whispers; he was very pale and bathed in cold sweat, which stood out in great beads on his face and saturated his bedding. The extremities were cold, and the patient complained of numbness of the arms. He pointed to the hypogastric region as the seat of his distress, but did not complain of pain elsewhere. The pulse was small, frequent, and intermittent. The strappings were removed and stimulants given, with an immediate relief of the symptoms.

ON THE PRACTICAL VALUE OF OUR PRESENT METHODS OF TREATING THE UPPER AIR-PASSAGES.

The subject was one referred for discussion to the main body by the Section in Laryngology of the New York Academy of Medicine, the discussion being opened by a paper by Dr. Francke H. Bosworth. (*Phila. Med. Times*, May 28, 1887.)

DR. BOSWORTH said it is now thirty-three years since Garcia demonstrated the feasibility of examining the interior of the larynx during life, and Czermak, availing himself of Garcia's teachings, presented to the medical profession a new method of treating disease and inaugurated a new specialty. He thought it was highly proper to stop for an instant and take an account of what progress had been made in this specialty. The early days of

this specialty were days of instrument-invention, and so rapidly did the number of appliances and ingenious devices for treating diseases accumulate that the impression grew that we treated disease by machinery. Nor was this impression ill founded. Dr. Bosworth thought that when we knew little about the treatment of these diseases our machinery was very extensive. As our knowledge increased the machinery disappeared, until now it might be carried in a hand-satchel.

He then spoke of special methods of topical applications in the treatment of the larynx, lower pharynx, vault of the pharynx, and nasal passages. Although speaking of the treatment of these separately, his conclusions with regard to each were the same: namely, that so-called chronic catarrhal inflammation of the larynx, lower pharynx, and vault of the pharynx was due to disease of the nasal passages; that chronic nasal catarrh was due to nasal obstruction, and the only radical means of relief consisted in removing such obstruction. This was to be accomplished by the use of the knife, saw, snare, or cautery. It was true the spray and the douche had their uses, but in no case had they ever cured chronic laryngitis or so-called chronic pharyngeal catarrh. Their action was only palliative and cleansing. No local applications directly to these parts ever cured such inflammation. It was not claimed for them by anybody that they would cure tumors, syphilis, tuberculosis, or paralysis. He had before said that the lower pharynx was in no sense a part of the air-tract. As he had but recently written on the subject of the surgical treatment of obstructions of the nose, he would now devote most of his remarks to the action of the cautery.

He claimed that the cautery destroyed only the superficial layer of the lining membrane of the obstructed nasal cavity, and that therefore its action in overcoming obstruction was not due to its destruction of tissue, but to its coagulation of the superficial structures, their contraction upon the dilated blood-vessels and hyperæmic tissues, in the manner that a film of collodion acts. This being the case, he claimed that the galvano-cautery was an expensive, especially a cumbersome, apparatus; one which could not be used with delicacy and exactitude; which was not without danger; and consequently its use should be dispensed with and chromic acid substituted. The latter possessed every advantage of the galvano-cautery and platinum wire, and had not their disadvantages.

With regard to apparatus for making spray, he showed a hand-atomizer with a single rubber bulb, which he claimed was as effective as the most costly air-pump and receiver; and, for examinations, a head-mirror two and a half inches in diameter was as good as the more costly.

Dr. A. H. Smith continued the discussion with a brief paper, in which he said there was growing scepticism as to our ability to cure all cases of so-called catarrh of the upper air-passages. Then, referring to the benefit to be derived in the treatment of chronic or subacute affections of the lining membranes of those passages by the employment of anodynes and disinfectants, especially by weak solutions of carbolic acid, he pointed out the limitations of such benefits. To show that surgical methods were not indicated in all cases or capable alone of curing diseases of the upper air-passages, he quoted the statistics of certain institutions, going to show that out of thirteen hundred and fifty-one cases only twenty-seven per cent. were considered as calling for an operation. It followed that in over seventy per cent. of the cases other treatment than surgical was required. Any person familiar with the subject must have seen patients with chronic nasal catarrh returning month after month, and year after year, to dispensaries and institutions, having nowhere been able to find complete and radical relief. This was not true alone of the specialty of laryngology and rhinology. The same thing was seen at clinics for diseases of women,—patients returning for months with chronic uterine catarrh, etc. He believed that a change of structure took place; that the vital conditions were altered, and they could not be restored by any measures which we had yet adopted or perhaps would ever discover. In other words, there were certain difficulties and limitations inherent in the case not chargeable to faulty methods of treatment or to want of skill. He had long since ceased to expect, as he had ceased to promise, complete and permanent cures.

Dr. William H. Thomson discussed the subject from the stand-point of the general practitioner. In his opinion, the treatment of chronic diseases of the upper air-passages should be directed chiefly by two principles: first, by taking cognizance of cutaneous nerve associations in the causation and perpetuation of inflammation of the mucous membranes; and, secondly, local disinfection.

Organs which were in symmetrical pairs,

such as the hands, feet, ears, and eyes, were so closely associated in vaso-motor relations that the same effect, as far as their circulation was concerned, was produced in both by an impression made on only one member of the pair. Second, there was a close relation between the sensory nerves of the skin and the vaso-motor apparatus of the viscera immediately beneath. Third, there were special relations between the vaso-motor functions of one part of the body and the nerves of sensation in a particular distant part of the body. Wet feet, for instance, might check menstrual flow. This relation also existed between the feet and the larynx, and between the nerves at the nape of the neck and the circulation in the nose.

Unfortunately, we have few vaso-motor tonics. In colds it would be of benefit to apply cold water to the nape of the neck on rising, keeping the hair dry, and to apply cold salt water to the throat. The neck and shoulders should be washed in cold water, dried, and then rubbed with sweet oil. Draughts of air were more harmful than a walk out in the cold air. Exposure of a portion of the surface of the body, especially at night, should be avoided. As to special covering, a thin woollen undergarment should be worn, and over that a perforated buckskin shirt. Buckskin drawers, perforated, might also be worn. He knew of no special clothing so beneficial as this. Chest-protectors, etc., which covered only a part of the surface, were worse than useless.

Speaking of disinfectants and their application in the treatment of diseases of the upper air-passages, he said it was hard to resist the belief, from the evidence already given, that the product of inflammation, as such, was always the result of infection. As soon as a particular tissue began to lose its normal amount of vitality, the enemy (micrococci) found it out and began its work. A practical deduction was that, as the onset of disease could be prevented only by excluding germs, so all chronic mucous inflammations could be got rid of only by driving out such germs after they had obtained access to the tissues. Two methods were to be adopted: first, strengthen the vitality of the parts; second, apply disinfectants directly to the affected parts. The greatest advance, he thought, would be made in the discovery of disinfectants and how best to use them.

Dr. H. H. Curtis had deduced the following conclusions from the observation of a thousand cases of disease of the upper air-passages. In all cases of nasal stenosis from deflection of the nasal septum, etc., there was subacute or chronic inflammation of the lining membrane of those passages, this inflammation extending also down to the pharynx, and here giving rise to glandular hypertrophy. This affection of the posterior wall in the faucial cavity was due to mouth-breathing, and disappeared on opening up the nasal cavities. Any treatment directed to this glandular hypertrophy without treatment of the nasal passages was without success. Disease of the ethmoid cells was generally due to hypertrophy of the middle turbinated body and consequent occlusion and prevention of exit of the ethmoidal secretions. The treatment consisted in the application of chromic acid to the thickened middle turbinated body in order to reduce the obstruction and allow free access of air and outlet for the secretions. He employed this escharotic to the exclusion of others, and he would be unwilling to exchange it for all the sponges, sprays, etc. Its use was followed not only by clearing up of the nasal passages, but also, in consequence of this, by disappearance of the granulations referred to, of laryngitis, pharyngitis, huskiness of the voice. The chromic acid should be used carefully, but he had not seen any bad results from it. The sooner the profession ceased to apply strong astringent solutions and nitrate of silver to the upper air-passages, and gave proper attention to restoring the respiratory functions of the nasal passages, the sooner would laryngology be placed on a higher plane and relief given to countless thousands suffering from so-called post-nasal catarrh.

Dr. W. C. Jarvis thought the spray was undoubtedly of great utility when properly employed. Pound-pressure, he said, meant nothing; but the dimensions of the pneumatic tube and the pound-pressure being given, we had everything. Cocaine would act better, more efficiently, and a less amount would be required when used by the spray than by any other method. Another remedy to be used from the spray was rhigolene, and it was often to be preferred to cocaine, especially where the latter failed to produce anæsthesia. He could not do without the spray for cleansing purposes. The coarse spray possessed nearly all the advantages of the douche. Powders were best applied fine by the compressed-air spray. Iodoform was best tolerated. Chromic acid and nitric acid had their uses. But chromic acid was a treacherous drug. Doubtless it was of benefit in

some cases; but it should not be used for the relief of hypertrophy of the lining membrane. It was a specific in its action on papillomatous tissue. Regarding the comparative value of surgical with other methods, he thought the decision had been pretty well settled in favor of the former. Where weeks and months were required to cure by local applications, relief and cure came from a single sitting when the snare, saw, or cautery was used. The apparently increased discharge in nasal catarrh was due to accumulation by obstruction, not to hyper-secretion. He spoke of the value of applications of vaseline or other unguents and agents for cleansing and protective purposes.

PYORRHŒA ALVEOLARIS.

Mr. Newland Pedley, F.R.C.S., read a paper at the Odontological Society upon the above subject. Pyorrhœa alveolaris is characterized by conditions as follows: The mucous membrane, especially that adjacent to the teeth, is deeply congested, tumid, and thickened, and detached from the necks of the teeth and from the roots. A thick, fetid discharge may often be pressed up between the teeth and mucous membrane, which gives to the breath a very repulsive odor. Later, the alveoli become absorbed, and at times more or less denuded, while the fangs of the teeth become coated with a layer of thin, hard, green-brown tartar. Ultimately, the disease progressing, the teeth, one after another, drop out. The pathological changes which take place are hypertrophy of the mucoperiosteal fold around the teeth, accompanied by dilatation of capillary loops, enlargement of the papillæ, and rapid proliferation of epithelial cells. Later the gum becomes firm and contracted, and displays increase of fibrous tissue. The changes which go on in the socket have not been yet satisfactorily worked out, but the examination of the jaws of some carnivora which were apparently affected with pyorrhœa alveolaris would lead to the supposition that there is osteitis of the alveolar process spreading towards the apex of the socket. There are many differences of opinion as to the causes, some maintaining that it is of parasitic origin and due to a specific bacillus, but there is no good proof of this; others that it is catarrhal, and an extension of inflammation of the mucous membrane; others that it is due to the irritation of small deposits of hard tartar under the edge of the gum, but this is plainly not the case, for the disease may be far in advance of the deposit, and in some cases there is not any to be found. It is probably due to some constitutional condition, and the fact that it is often symmetrical, and frequently hereditary, gives support to this view. It occurs in the mouths of patients whose health has been undermined by debilitating influences and injudicious habits of living; it is a common sequel of malarial fever in America; young persons recovering from eruptive fevers are sometimes subjects of pyorrhœa alveolaris; and frequent pregnancies are a fruitful source of the disorder. Attention has been lately drawn to the shedding of the teeth in tabes dorsalis, but it does not by any means seem to be a constant symptom. Mr. Bland Sutton has found that premature loss of the teeth is a very common feature in cases of rheumatoid arthritis in animals, and has also met with it in mollities ossium and other wasting diseases. Magitot, who views the alveolar-dental periosteum as a ligament, and not of the same nature as osseous periosteum, calls the disease symptomatic alveolo-arthritis, and mentions especially as causes chronic Bright's disease and glycosuria, in which latter, he says, the phenomenon is absolutely constant.—*The Lancet*, May 7, 1887.

THE TREATMENT OF MIGRAINE WITH A DOMESTIC REMEDY.

Rabon, of Berlin, writes as follows in describing his experience with this treatment in the *Therapeutische Monatshefte* for April, 1887:

"It is no wonder that against so common and annoying an enemy as migraine an immense array of lauded remedies are advanced. Among these we find some powerful drugs,—nitro-glycerin, amyl nitrite, aconitine, cocaine, and others,—and also many remedies whose application is inconvenient, as massage and electricity. It is furthest from the purpose of the writer to undervalue the effect of these agencies. If a new remedy is proposed the excuse for its introduction must be that it is simple, harmless, and easily obtainable.

"As Nothnagel some years ago reported good results in treating epilepsy with common salt, it occurred to me that migraine could possibly be prevented by small doses of this agent. I accordingly ordered a young man suffering from 'petit mal,' whose seizures were preceded by a well-defined aura, to keep common salt with him, and at the first indication of the aura to take a convenient quantity. The order was followed, and proved successful in every instance. En-

couraged by his success, an aunt of the patient, who had suffered severely for years from migraine, which was preceded by unpleasant gastric sensations, began to take salt to cure her migraine. She took a half or a whole teaspoonful, and drank a little water after it. This treatment was regularly successful when the attack was just beginning, and a fully-developed attack was stopped in half an hour.

"After this case I felt encouraged to try this simple remedy in similar cases, and the results were so good that I feel justified in recommending the remedy. Where the attacks of migraine are attended by symptoms of gastric distress salt is especially efficient, if given promptly.

"My record of cases up to the present embraces only six in whom a positive result was obtained. I hope, however, to attract the attention of others to the use of the remedy. An explanation of the way in which the result is obtained I hope to furnish in the future. Its power in eliciting reflex action seems to me a natural explanation of the effect."

THE USE OF FUMING INHALATIONS IN ASTHMA.

The relief which a well-arranged inhalation affords in the dyspnœa of bronchial asthma is indisputable.

Sir James Sawyer, in the *Birmingham Medical Review* for May, 1887, has prescribed the following fuming inhalation for asthmatic patients with marked success:

℞ Potassii nitrat., ℥ss;
Pulv. anisi fruct., ℥ss;
Pulv. stramonii fol., ℥i. M.

A thimbleful of the powder placed on a plate is pinched into a conical shape and lit at the top; it burns with a smouldering flame like a pastille, and is held near the patient, who inhales the smoke. The writer states that this method of treating the dyspnœa of bronchial asthma is very marked in its good results in a large proportion of cases. The remedy, however, is only palliative of the asthmatic paroxysms, but it is in these cases that we are often called upon to give prompt relief. For the reduction of the frequency and severity of the asthmatic attacks many other resources are of course favorable in the direction of dietetic, climatic, hygienic, and medicinal therapeutics.

TWO CASES OF RUPTURE OF THE UTERUS; LAPAROTOMY; RECOVERY IN BOTH CASES.

Dr. Simon Lederer, of Asch, in Bohemia, reports these cases as follows in the *Prager Medicinische Wochenschrift*, No. 15:

In the first a contracted pelvis, whose conjugata vera was not sufficiently shortened to indicate the use of artificial means for completing labor, existed. The patient's general condition and strength were good, and the physician deemed the labor progressing satisfactorily, and left the patient, a primipara, to return in a few hours. On his return, he was informed by the midwife in attendance that the labor-pains had ceased a half-hour previous; the patient was then asleep. An examination revealed the fœtus partly in the abdominal cavity, and a hand prolapsed into the vagina. Laparotomy was immediately performed under deep chloroform-narcosis. A large, fully-developed child, with a large head, was removed. The abdomen was cleansed, and the uterus contracted well. A firm abdominal bandage was applied.

Recovery was complete in seventeen days. The entire wound healed by first intention, and but very moderate reaction followed.

Two years later the same woman was delivered, without the services of a physician, of a still-born child, after a rapid, easy labor.

The second case was that of a multipara, who had previously been delivered by the forceps, and had once borne spontaneously after a tedious labor. The pelvic measurements were normal. The uterine rupture was announced by the cessation of the pains and the expulsion of blood from the vagina. As the woman was in good condition, laparotomy was done at once. On the third day after the operation metro-peritonitis set in, which was combated by iced compresses over the abdomen, quinine and opium, free stimulation, and antiseptic douches. Rapid improvement followed, and the wound healed by first intention, except its lower angle, from which healthy pus was discharged, which soon ceased. Nine weeks after the operation, in the absence of the physician's care, the patient ate a large quantity of fresh, ill-baked bread. Peritonitis followed, with great prostration and collapse and death. A post-mortem examination could not be made, and the cause of the peritonitis was not discovered. It is possible that intestinal adhesions had formed, which were broken by the disturbance caused by the ill-digested food.

In the first case the child was found lying

with its back towards the abdomen of the mother, and was easily extracted.

In the second case, the rupture was in the posterior surface of the uterus, and the child was extracted with difficulty.

[The writer makes no mention, in his description of the operation, of suturing the uterus or performing Sänger's operation. He seems to have performed the primitive Cæsarean section only.—TRANSLATOR.]

HOW SHOULD SANTONIN BE PRESCRIBED TO OBTAIN ITS FULL PHYSIOLOGICAL EFFECT?

DR. K. A. NORDERLING, of Rockford, Ill., communicates the following to the *New York Medical Record*, April 23, 1887: "After the introduction of santonin into the system, the urine will in a short time become of a cherry-red color. Santonin will give the same color when dissolved in an alkaline solution, or when heated to liquefaction with the addition of caustic potash. The drug, therefore, undergoes in the system a change similar to that produced by alkalies and heat. Santonin is insoluble in water and dilute acids, but dissolves in the saliva, the gastric, intestinal, and pancreatic juices. This solution in the gastric juice takes place so rapidly that the maximum dose is completely absorbed in the stomach, as has been shown experimentally by Lewin. But it has also been proved by experiment that santonin, when given in an oily solution, is not at all absorbed in the stomach, but the entire quantity passes into the intestine. It is evident that when the drug is given in powder it will be absorbed and taken up in the circulation before reaching the intestine, and consequently, in order to obtain its vermicidal effect, it must be administered in such a form that it will not be acted upon by the gastric juice. Küchenmeister has shown that the drug must be in solution, as he found that ascarides were not affected by santonin crystals floating in water, but were killed when brought in contact with an oily solution of the drug. In order, therefore, to accomplish its therapeutic object, it is necessary that santonin be in a form in which its vermicidal action can be exerted, and also that it reach the habitat of the parasite. To make the solution, any form of oil may be used, and the best effect is obtained by three grains of santonin dissolved in two ounces of oil, to be taken in four doses. It is also a good practice to add one drop of wormseed oil to each dose, as researches have shown that all ethereal oils are poisonous to the lower organisms. If a movement of the bowels is desired, castor oil will be suitable, although not in too large a dose, because with strong peristalsis the santonin does not remain long enough in the intestine to produce the desired effect. About two drachms of the oil to each dose will be sufficient."

ALMÉN'S TEST FOR SUGAR.

Of all tests for sugar in urine, Fehling's is undoubtedly the most satisfactory. The only objection that can be urged against it is the difficulty of preserving it a sufficient length of time, so that unless recently prepared it may lead to fallacious results, owing to stale solutions having a tendency to throw down the suboxide of copper spontaneously when heated. This, of course, is a great disadvantage to practitioners, who may be seldom called upon to use the test, and are at a distance from manufacturing chemists from whom they may procure a fresh supply. To remedy this PROFESSOR ALMÉN, of Upsala, has improved the old bismuth test for sugar, and has prepared a solution which has the advantage of keeping unchanged for years, and being at the same time an extremely delicate test for sugar in urine. It consists of a solution of bismuth subnitrate, with caustic soda and potassio-sodium tartrate. In testing for sugar, the albumen, if present, must be first removed by precipitation by heat and acid, and one part of the solution treated with ten of the urine, when, if sugar is present, the bismuth will be deposited in a metallic state. The test is sufficiently delicate to detect sugar in the proportion of only .05 per cent. This test, as we have already said, is chiefly valuable on account of its preservative qualities, keeping well on board ship and in hot climates, though we doubt if it will supersede the use of Fehling's solution, especially as the latter is now supplied in hermetically sealed capsules which preserve the test for a considerable time.—*The Lancet*, May 14, 1887.

NUTRIENT ENEMATA.

EWALD, of Berlin, writes to the *Therapeutische Monatshefte* for April, 1887, his usual methods of preparing such enemata as follows:

In hospital practice an enema may be made most simply by beating up three or five eggs with four or five ounces of a fifteen or twenty per cent. solution of grape-sugar, and this

mixture may be carefully injected, as most convenient. If needed, starch solution, or a mucilage-water, may be added, or, if there exists much irritation, a few drops of tincture of opium. An injection of about eight ounces of tepid water, or solution of common salt, should precede the nutrient enema, and the latter should not be given until the bowel is thoroughly emptied; otherwise the nutrient matter may be at once rejected. Enemata should not be larger than eight or nine ounces, and it is better when this amount is given in two or three doses during the day.

When more elaborate methods can be followed, two or three eggs should be beaten with a spoonful of cold water. As much powdered starch as the point of an ordinary kitchen-knife will take should then be added, and a small cup, or half a large glass, of twenty per cent. solution of grape-sugar, which may be purchased at any chemist's. The whole should be gently heated, and a wineglassful of common red wine added.

The mixture should then be gently stirred or beaten, and the caution should be observed not to heat it so hot as to coagulate the egg albumen. When ready for injection the quantity of fluid should not exceed a half-pint.

If peptones can be easily procured, a teaspoonful of the peptone may be added to the solution of sugar; while advantageous, it is not absolutely needed, for eggs prepared without peptones are easily absorbed.

The enema should be given with a syringe whose terminal tube is long and flexible, or an irrigator, whose rectal tube is large and flexible, may be used. After taking enemata the patient should be kept quietly upon the back, or on the side, for some time.

METHYLAL.

Since the appearance of our issue of April 15, in which we published a summary of the results obtained by several investigators as to the action of methylal, it has been anew investigated by Dr. M. Motrokhin (*The Lancet*, May 7, 1887). He found that in frogs hypodermic injections of from 0.2 per cent. to 0.3 per cent. of the animal's weight produced more or less profound anæsthesia, which, however, quickly passed away. The lethal dose for frogs was found to be 0.8 gramme. Reflexes were weakened, and with large doses temporarily abolished. Thus, after giving a frog 0.3 gramme of methylal, irritation of the central end of the sciatic nerve during the period of complete narcosis produced no effect, but when the animal was aroused some reflex activity returned. Irritation of the peripheral extremity of the nerve showed that the drug had produced no effect upon its reflex action. Warm-blooded animals are more susceptible to the effects of methylal than frogs, a quantity equal to 0.25 per cent. of a rabbit's weight throwing it into a deep sleep lasting from one to two hours; with larger doses, loss of co-ordination in the movements was first observed, then the animal fell on its side, and remained in a state of narcosis for from three to four hours, after which it quickly recovered. The lethal dose was 0.45 or 0.5 per cent. of the animal's weight. The irritability of the cortex of the cerebral hemispheres was lowered both by hypodermic injections and by the inhalation of the vapor. Convulsions due to strychnine and picrotoxine in animals subjected to the action of a moderate dose of methylal were diminished in violence, but when the strychnine or picrotoxine was given in lethal doses death was actually accelerated by methylal. Methylal can be employed in the form of vapor for inhalation, or as a liquid for internal administration. When given hypodermically in an aqueous solution of the strength of 1 in 3, it is very painful, and the skin is apt to slough near the puncture. Dr. Motrokhin does not think methylal is likely to be of use in poisoning by strychnine and picrotoxine, except when only small quantities of these poisons have been introduced into the system. Regarding inhalations, two ounces may be inhaled, and only produce in addition to anæsthesia slight headache and dizziness. No experiments seem to have been made with a view to ascertaining the value of methylal as a surgical anæsthetic, but it does not seem to affect the heart's action perceptibly. Prof. Anrep noticed especially that the anæsthesia was more marked on the upper part of the body.

CHOLERA IN PREGNANCY.

Dr. Queirel, of Marseilles, contributes an interesting article to the *Nouvelles Archives d'Obstétrique et de Gynécologie* for April 25, 1887, in which he reports thirty-five cases which he personally observed, and thirty-two cases whose records have been given him by others,—sixty-seven in all. Of these, thirty-nine died and twenty-eight recovered. Pregnancy was interrupted in twenty-nine, in thirty-eight it continued until the child was

born at term or the mother perished. The conclusions of Dr. Queirel are as follows:

Pregnancy is not a predisposing cause, but increases the gravity of cholera.

We do not know whether cholera is transmitted from mother to fœtus; *in utero* the disease is very fatal.

It is a frequent cause of abortion, which does not lessen the severity of the disease in the mother.

The attack of cholera must be of unusual length if the woman does not die before aborting. Abortion from cholera is more frequent in the second than in the first half of pregnancy. A number of such prematurely-born children survive.

A large proportion of children born during the attack of cholera die from the disease in the first few days of their lives. Cholera occurring during the post-partum period is very severe.

The disease destroys lactation if established.

From a clinical stand-point the phenomenon most interesting is severe pain in the vertebral column and about the back.

The mortality among children was seventy-one per cent.

SALOL.

Salol, or salicylate of phenol, has been recently used with considerable success in Germany, both as an antipyretic and local disinfectant. GEORGI (*Berlin Klin. Woch.*, 1887, Nos. 9 and 11) found it useful as a dusting-powder in facial erysipelas; he mixed it with an equal quantity of powdered talc. He likewise employed it locally with advantage in angina, diphtheria, and stomatitis, first making a five per cent. solution in alcohol, and then mixing a small quantity of this with water. In a case of ozæna, the insufflation of a powder consisting of equal quantities of salol and talc every two hours removed the bad odor, though it did not cure the ailment, for he found it necessary to use also astringent irrigations. Given internally, he found it acting beneficially as an antipyretic in phthisis, typhoid fever, acute rheumatism, and other febrile ailments. In phthisis, doses of 7 grains were first given, and then larger quantities, until the effects desired were obtained. He found that 22 grains could be given for a dose, and seventy-five grains in nine hours, without any disagreeable results. In rheumatism it reduced the temperature and relieved the pains. He records favorable results of its administration in one case of sciatica and three of cystitis.

SEIFERT (*Centralb. f. Klin. Med.*, April 2, 1887) confirms Georgi's favorable report. He used salol as a wash or gargle, in ulceration of the tongue, stomatitis, angina, and diphtheria, first dissolving six parts of salol in one hundred of spirit, and then adding a dessert-spoonful of this solution to a glass of warm water. Seifert also used salol as a powder for insufflation, but he finds it less beneficial than iodol, because, though antiseptic and non-irritating, it does not adhere sufficiently well to mucous membranes and ulcerated surfaces.—*Medical Chronicle*, May, 1887.

EXTREME FREQUENCY OF PULSE AFTER PARACENTESIS.

An interesting case, in which extreme frequency of the pulse followed puncture of the abdomen for ascites, is reported and discussed in the *St. Petersburger Medicinische Wochenschrift* by PROFESSOR DEHIO, of Dorpat. The patient was a man aged 56, with cirrhosis of the liver. In addition to a considerable degree of ascites, there was general œdema and an old-standing hernia, but no heart-mischief could be detected, and the pulse was 86, regular, and of moderate tension. Immediately after the operation the man felt better, and was able to breathe more easily, and a slight rise of the pulse was then noted. The next day the face was pallid, and the patient complained of giddiness and prostration. The radial pulse had become 162, thready, and weaker; the second sound of the heart could scarcely be heard. This condition continued without any great alteration for five days, the pulse-rate varying from 180 to 150. No rise of temperature occurred, and the respiration was about 24. At Professor Kobert's suggestion two milligrammes of coronilin were introduced subcutaneously, which was shortly followed by a reduction of the pulse-rate to 80. A few hours later, however, it rose again to 182. The next day, without any repetition of the coronilin, and indeed without any assignable cause, the pulse sank to 84, and did not again rise to any remarkable extent. From this time, however, the patient's general condition became worse, and he died eighteen days later. The necropsy showed fatty degeneration of the heart and general diffused arterio-sclerosis. There was some hemorrhagic pachymeningitis and a good deal of clear fluid in the ventricles of the brain, the

cerebral substance being of moderate consistence, without any softening and containing less blood than usual. The cerebellum and medulla were in the same condition. The cause of the extreme frequency of the pulse was evidently not the disease of the heart and vessels, as this still existed at the time of death, or eighteen days after the pulse had resumed its normal rate. It must be looked for in the anæmia of the medulla, which doubtless followed the operation. Dr. Dehio proceeds to discuss the question whether this anæmia affected the heart by stimulating the accelerator (sympathetic) centre or by paralyzing the inhibitory (vagus) centre, and strongly inclines to take the latter view, quoting Nothnagel, who, in a recent article, says that when an extreme frequency of pulse is found associated with regularity of the intervals between the beats, a weak cardiac impulse, and an absence of other symptoms, or the existence of such as point to an incomplete emptying of the ventricles, paralysis of the inhibitory apparatus is indicated. Exactly these conditions existed in this case, as shown by its history and the sphygmograms obtained, which were of a hyperdicrotic type. Traube has also described a case of this rare condition. An old man, with phthisis, was unable to sit up in bed from the extreme frequency of pulse produced by the anæmia which the upright posture caused in the medulla, which, according to Traube, induced paralysis of the inhibitory apparatus, "the action of which is more easily suspended than that of the respiratory and vaso-motor centres." Another reason given by Dr. Dehio for the view he takes is that it is hardly possible that stimulation of the accelerator apparatus should have been kept up for so many days without any sign of the centre becoming fatigued, the interval between the pulse-beats not having altered at all. The fact was that when the abdomen began to refill the medulla became engorged with blood and the vagus resumed its proper functions. Nothnagel has pointed out the analogy between the sudden loss of regulating power of the vagus, and the sudden loss of consciousness in epilepsy and fainting which is produced by very slight interference with the blood-distribution.—*The Lancet*, May 28, 1887.

IMMUNITY BY INJECTION OF CHEMICAL BODIES.

Dr. L. C. Wooldridge recently communicated to the Royal Society a method by which he had been able to protect rabbits from anthrax, which is of considerable interest in connection with the general question of the nature of protection in this and other diseases depending on micro-organisms. The method consists in cultivating the anthrax bacillus in an alkaline solution of a peculiar proteid body which can be obtained from the testis and thymus gland. The growth is not abundant, and, after two days at 37° C., it is removed from the culture-fluid by filtration. A small quantity of filtered liquid is injected into the circulation of a rabbit, and the animal can then withstand the inoculation of extremely virulent anthrax blood. The bacillus itself grown in this peculiar culture-fluid has no protective influence; it either kills or it has no effect. The result is extremely curious, for hitherto protection against zymotic disease has been effected by the communication to the animal of a modified form of the disease against which protection is sought. In Dr. Wooldridge's experiments the protection must be produced by some chemical body the product of the activity of the bacillus. The observation belongs to a new order of facts, and appears to fall in with M. Pasteur's theory as to the method in which immunity to hydrophobia is produced by inoculation of the spinal cord of rabid rabbits. Both find some support in Professor Cash's experiments with perchloride of mercury, in which it was shown that after animals had taken a sufficient quantity of the drug, they were no longer liable to anthrax.—*The British Medical Journal*, May 21, 1887.

PATHOGENY OF GASTRIC ULCER.

The precise pathogeny of chronic ulcer of the stomach is one of those undetermined questions which have led to considerable speculation, with comparatively little profit. The position, form, and nature of the ulcer have done more than any positive demonstration of the vascular lesion to favor the current doctrine of its dependence on arterial blocking. But every one knows the difficulties in the acceptance of this view, not the least being the comparative frequency of the disease in the female sex, and the great preponderance of cases where the ulcer is solitary and seated on the posterior surface near the lesser curvature. Dr. Decker, of Würzburg, has the last word on the subject (*Berl. Klin. Wochenschrift*, No. 21), and he advances evidence in support of the initial lesion being traumatic, or rather thermal. Thus, he believes that the contact of hot thickened fluids

with the gastric mucosa excites hyperæmia, which becomes localized, and may lead to venous stasis and hemorrhage in a limited territory, with all the subsequent necrotic changes. He supports his view not only by reference to the clinical history of cases of gastric ulcer (he points to the great prevalence of gastric ulcer among cooks, who habitually test the flavor of their dishes when very hot), but by two experiments on dogs into whose stomach food heated to 50° C. was introduced. In one of the animals a patch of hyperæmia, with hemorrhage between the gastric mucosa and muscularis near the lower curvature, was found; in the other, a deep ulcer of characteristic shape and position had been produced.—*The Lancet*, May 28, 1887.

ACTION OF HYOSCINE ON THE EYE.

Dr. O. Walter, of Dorpat, has published a series of observations on the action of hyoscine on the eye. This body produces some toxic effects very similar to those produced by atropine,—viz., dryness of the throat and dilatation of the pupils; but, unlike atropine, it causes drowsiness and languor; it also sometimes causes nausea and giddiness. Until lately little has been known of the effects of hyoscine on the eye, but within the last few months two other Dorpat students, working under Professor Kobert's direction, have paid some attention to the subject,—one of them, Dr. Sohrt, having published a paper on the general, therapeutic, and physiological effects of hyoscine. Hirschberg and Emmett had, however, remarked the mydriatic action of this subject. Dr. Walter experimented on animals by instilling hyoscine into one eye and atropine into the other, and found that a drop of an exceedingly attenuated solution produced distinct dilatation, acting both on the pupil and on the accommodation much more rapidly than atropine. The dilatation passed off more quickly than that produced by atropine, but the paralysis of accommodation persisted about as long as that produced by an equally strong solution of atropine. No decided effect was remarked on the intra-ocular pressure, but in patients with chronic glaucoma the regular application of hyoscine certainly produced an improvement in the sight and an enlargement of the field of vision. Slight toxic symptoms were produced by two drops of a one per cent. solution. The author recommends repeated applications of a weak solution in preference to a single application of a strong one.—*The Lancet*, May 28, 1887.

THALLIN IN THE TREATMENT OF GONORRHŒA.

According to the Swiss correspondent of the *British Medical Journal*, May 21, 1887, Professor E. Kreis, of Zurich, has recently carried out in Professor Kleb's laboratory a series of experiments on the influence of thallin on gonococci. He found that a solution of sulphate of thallin of a strength of from four to one-half per cent. completely destroyed the microbes. It may also be mentioned that the drug proved a powerful germicide in regard to the anthrax bacillus and staphylococcus aureus. In view of Dr. Kreis's statement, Professor Goll, of Zurich, treated several cases of gonorrhœa, both acute and chronic, with injections of solutions of thallin of various strengths. When given at the beginning of the inflammatory stage injections of a two to two and one-half per cent. solution of the sulphate caused rapid subsidence of the inflammation and quickly changed a purulent into a milky, sero-mucous discharge. In a group of cases seen on the fifth, eighth, or ninth day of the affections, the same injection, repeated twice or thrice a day for six or ten successive days, cured the patient in from eighteen to twenty-five days. The thallin treatment seemed, to a certain degree, to prevent such complications as epididymitis, cystitis, irritability of the bladder, etc. In cases of gleet, Professor Goll obtained good results from irrigation of the urethra by means of a Nélaton catheter, with a one or one and one-half per cent. solution of thallin. Internal administration of the drug in doses of 25 centigrammes every three hours cured a very bad case of gonorrhœal cystitis with epididymitis in five days. In another man, aged 70, long-standing cystitis of gonorrhœal origin was speedily relieved by the internal use of the drug in daily doses of 25 to 30 centigrammes.

THE RELATION OF CERTAIN FORMS OF HEADACHE TO THE EXCRETION OF URIC ACID.

At a meeting of the Royal Medical and Chirurgical Society, held May 23, Dr. Alexander Haig communicated a paper on the "Relation of a Certain Form of Headache to the Excretion of Uric Acid." Previous papers by the author on the influence of diet in this headache, and its clinical relationship to gout, are referred to. An investigation of the urine was undertaken with a view of testing the relationship to gout. Meat and cheese were taken with the object of bringing on a head-

ache, for purposes of experiment. The relation of this headache to the excretion of uric acid at first appeared equivocal, but definite results were obtained on separating the urine excreted *during* the headache from that before and after. There appears to be retention of uric acid before the headache, excessive excretion during the headache, and diminished excretion after the headache. The excess during balances the diminution before and after; there is no absolute excess of uric acid; hence the previous equivocal results. During a headache there is little or no alteration of the excretion of urea. The relation of the uric acid to the urea is important, and is greatly altered during the headache. When, as the result of *plus* exercise, there is a large excretion of urea and uric acid (though in their normal relation), headache is not far off; and if anything causes the uric acid excretion to fluctuate, headache will be present during its excess and absent during its diminution. This fluctuation in the excretion of uric acid does not affect the urea, is temporary and transient, and there is proof that urates may accumulate while the kidneys are quite sound. The theory which best explains everything in this connection is that of diminished alkalescence of the blood. Does gout consist in a diminished power of forming ammonia to neutralize acids, resulting in a permanent diminution of the alkalescence of the blood? The influence of meat diet and beer in this respect, and the well-known connection of fourpenny ale with gouty deposits, are referred to. A dose of acid, either introduced from without or formed internally, may cause temporary retention of uric acid, and so lead to headache. Beer will do this. Retention possibly does not explain everything, as the excess during the headache appears to exceed the previous retention. There may be temporary excessive formation as well, hence the good effect of salicylate of soda, which diminishes the formation of uric acid. The good effect of a meal on this headache is due to the fact that it increases for a time the alkalescence of the blood. Hence also the good effects of a somewhat vegetarian diet and alkalies in its treatment. The relation here shown between the headache and the excretion of uric acid has an important bearing on the pathology of gout and other diseases connected with uric acid, in demonstrating the way in which temporary retentions of uric acid may be occasioned, and in supporting the theory of diminished alkalescence of the blood, as a cause of these retentions.

Mr. G. D. Pollock related his personal experience of headache. The urine passed during the attack was always pale and clear. Bilious vomiting used to terminate the attack. Calomel soon afforded relief.

Dr. Cheadle congratulated Dr. Haig on his valuable paper. He doubted, however, whether irregular excretion of uric acid would explain all headaches. Women who were not large meat-eaters suffered from this headache. After railway journeys or anything causing vibrations, the headache could hardly be due to faulty excretion of uric acid. He knew a boy who journeyed from Ireland to Eton and always had a prostrating headache, the result of this journey. The scent of strong flowers—*e.g.*, hyacinth—also caused a headache. He (Dr. Cheadle) also suffered from megrim if for one hour he remained in an ill-ventilated room. A good dose of wine would sometimes cause megrim to disappear, and this seemed to militate against the views advanced.

Sir Dyce Duckworth referred to the two classes of large eaters and drinkers, and those who could not eat or drink to excess without suffering soon from headache and other symptoms. This latter class had a smaller margin for the disposal of excess of food, and he supposed that Dr. Haig belonged to this class. He thought that the author deserved great credit for so painstaking an investigation.

Dr. Percy Kidd was conscious of at least two sorts of headache,—one for which no remedy is useful; the other brought on by obvious causes, and easily relieved by stimulants and other means.

Dr. Ward thought there were three sorts of headache, in his own experience. Tiny little chalk-stones from the joints of the hands were obtained at the age of fourteen, when the real megrim began. The nervous headache was probably quite distinct in its causation from that which arises from inspecting a picture-gallery or from excitement. This latter kind may be relieved by a dose of strychnine. Other headaches experienced by him were amenable to sal volatile. Bottled beer is less liable to cause headache, owing to the soda added. A specific gravity of 1030 was also noticed, followed by a copious deposit of urates. Sometimes a decided exaltation of spirits preceded the severe form of headache.

Dr. Hingston Fox inquired as to the method of estimating uric acid best adapted for clinical work.

Dr. Haig had noticed the light color of

the urine, but this seemed to have no relation to the amount of uric acid. He explained his views of the relation of diminished alkalescence of the blood as causing a retention of uric acid.—*The Lancet*, May 28, 1887.

THE PHYSIOLOGICAL ACTION OF REMISIA FERRUGINEA.

At a recent meeting of the Biological Society, MM. PINET and DUPRAT communicated a note on the physiological action of *Remisia ferruginea*. The forms employed in the experiments were an aqueous and a hydro-alcoholic extract of the root of the plant. Both extracts, as tested by litmus-paper, showed a decided acid reaction. The hydro-alcoholic extract was much less active than the aqueous extract. The experiments were made on frogs weighing thirty grammes, and the dose was the quantity contained in three divisions out of twenty in a Pravaz syringe. A quarter of an hour after the injection, in the foot of one of the hind legs, the animal was found to show general hyper-excitability, with considerable increase of respiratory movement and cardiac pulsation. In some of the animals the energy of ventricular contraction was so great as to produce asphyxia, that continued throughout the entire duration of the intoxication. The heart was found to be abnormally red. Electric contractibility of the muscles remained intact. Ligature of the iliac artery on one side, with injection of the extract into the opposite member, produced no difference in the effect. Section of the lumbar nerves on one side, with injection into the opposite member, caused the convulsions to appear only on the side where the innervation remained intact. When the spinal cord was divided below the medulla, no convulsive action took place. Ablation of the cerebral hemispheres in no way affected the phenomena above described. The authors conclude that *Remisia ferruginea* affects principally the medulla.—*The London Medical Record*, May 16, 1887.

Reviews.

ANÆMIA. By Frederick P. Henry, M.D. Philadelphia: P. Blakiston, Son & Co., No. 1012 Walnut Street, 1887.

This is a very clear, well-written little book, containing a great deal of information upon the subject of which it treats, an epitome of our present knowledge, invaluable to any practitioner of medicine who is not thoroughly up with the literature of the day. Simply written, the result of thorough study, we can commend the volume highly to our readers.

The author classifies anæmias as follows: I. *Primary Anæmias.* Chlorosis, lymphatic anæmia (Hodgkin's disease), splenic anæmia, leucocythæmia, pernicious anæmia. II. *Secondary Anæmias.* Anæmia of fever, anæmia of hemorrhage, anæmia of phthisis, anæmia of heart-disease, anæmia of cancer, anæmia of syphilis, etc. III. *Toxanæmias.* Anæmia of lead-poisoning (saturine anæmia), anæmia of arsenic-poisoning; anæmia of arseniuretted hydrogen poisoning, anæmia of phosphorus-poisoning, anæmia of nitric oxide poisoning. IV. *Parasitic Anæmias.* Anæmia caused by Anchylostomum duodenale, anæmia caused by Bilharzia mæmatobia, anæmia caused by Filaria sanguinis, anæmia caused by Plasmodium malariæ.

Careful reading of the latter pages of the book, in which these various forms of anæmia are described, has confirmed us in the belief that we many years ago expressed, that the present divisions of anæmia are unsatisfactory. There can be no such thing as primary anæmia, for anæmia is not a disease, but a symptom or result. The blood does not generate itself, but is produced by various organs, and is subjected to various destructive processes. Anæmia which results either from disease of the blood-making organs or from an affection of the blood-destroying organs, is as much secondary as one which is produced by hemorrhages or phthisis. The imperfection of the popular classification is further shown by the fact that pernicious is stated by Dr. Henry to be very generally the result of the atrophy of the gastric tubules. Therefore, although classified by the author as primary anæmia, it is, according to his own showing, a secondary one. He himself feels this, and attempts to explain the inconsistency, but to our thinking his explanation amounts to nothing.

We are not in making this criticism objecting to the book, which simply is in its view of the subject reflex of the general professional thought of the day. A more original writer than its author appears to be might have attempted to treat of the diseases which produce anæmia, or, at least, would have recognized anæmia as a symptom or result of disease, and classified the forms of it accordingly.

EARTH AS A TOPICAL APPLICATION IN SURGERY. By Addinell Hewson, M.D. Second Edition.
Philadelphia: The Medical Register Co., 1887.

In the preface to this the second edition of Dr. Hewson's book, he writes, "It is now issued to meet the demands constantly made for the work, and especially for it as it was originally produced; I have not seen fit to alter it in any respect." The concluding phrase of this sentence may also properly express our view, since we still hold to the same opinion that we did when the first edition appeared, and are not now inclined to alter it in any respect. We continue to think if the results claimed by Dr. Hewson were obtained by the earth treatment, the same and even better results are more likely to be gained by other and less objectionable applications.

CYCLOPÆDIA OF OBSTETRICS AND GYNÆCOLOGY. ANATOMY OF INTERNAL AND EXTERNAL GENITALS, MENSTRUATION AND FŒCUNDATION, NORMAL PREGNANCY AND LABOR. Being Vol. I. of a Practical Treatise on Obstetrics. By Dr. A. Charpentier, Adj. Prof. at Faculty of Medicine, Paris. Translated by Egbert H. Grandin, M.D., etc. In four volumes, two hundred and sixty-seven fine wood engravings, and four colored plates.
New York: Wm. Wood & Co., 1887.

The author aims "to give the practitioner, the student, and the midwife a sufficient, although condensed, knowledge of modern researches." More ambitious than a manual of obstetrics, its author feels sure, from his practical opportunities and his extensive reading, that the Cyclopædia will meet the wants of both practical and theoretical men. The first volume is occupied with, first, a section on anatomy, carefully and thoroughly written, and well illustrated; second, a section on "physiological phenomena," which goes deeply into the mysteries of reproduction, describing even the act of copulation so thoroughly that even the wayfaring man, though a fool, need not err therein, touches upon the question of the production of sex at will, leaving the subject still involved in uncertainty. Describes the process of artificial fecundation, so that any competent person may start out as an artificial fecundator, and discusses fully the topic of sterility; thirdly, a section is given on pregnancy, which, traversing well-trodden ground, will still reward the searcher by some few novel views, and much old and valuable wisdom; and, fourth, a section on labor, which differs but little from the same subject-matter in other obstetric manuals. The illustrations of this section are only fairly good; the last, a child being resuscitated in a spirophore, while of indifferent execution, is designed with remarkable spirit. E. W. W.

CYCLOPÆDIA OF OBSTETRICS AND GYNÆCOLOGY. THE PATHOLOGY OF PREGNANCY. Being Vol. II. of a Practical Treatise on Obstetrics. By Dr. A. Charpentier. In four volumes.
New York: Wm. Wood & Co., 1887.

Vol. II. of the Encyclopædia will prove even more useful than Vol. I. Its range of topics embraces a wider field than the usual one of the obstetric manual. Its first chapter discusses the diseases affecting the pregnant woman, and gives us a mass of information carefully assorted and easy to find at short notice. The relations of cholera to pregnancy, in times of epidemic cholera, are of deep interest. At other times, of course, they are generally overlooked. The author has carefully studied the results hitherto published, and gives us the percentage of miscarriages, delivery, safe retention of the fœtus through the disease, and the infant and maternal mortality. "In the influence of labor on malaria," the author mentions the frequency with which attacks of malaria follow delivery in women not previously affected by the disease.

Scarlet fever the author believes to be almost absolutely fatal to the pregnant woman, though delivery, premature or at term, generally precedes death. In advanced pregnancy he finds measles a very dangerous disease, though more fatal to the child than to the mother. Erysipelas "seems to be less serious than variola." In typhoid fever the danger to the fœtus is occasioned by the high temperature; its peril begins at 104°. To the mother this disease affords more favorable chances than to the fœtus.

While pneumonia forms a very serious complication for both mother and child, pleurisy "does not appear to affect either the course of pregnancy or the life of the mother," except in exceptionally severe cases, and in eighteen cases collected by the author there were but two miscarriages.

In regard to phthisis and influence of pregnancy on it, the author follows and confirms the observations of Gaulard, and believes its influence to be uncertain, sometimes hastening, at times retarding, sometimes causing an apparent outbreak of the disease, and often an apparent cessation of the process. Delivery, however, tends to aggravate, and lactation certainly does aggravate the previously existing condition.

By an evident error the author is made to say that icterus in pregnancy may assume one of two forms,—"the sporadic and the epidemic, or the benign and the innocent." The author describes what he terms the malignant or grave form. In this form he condemns as bad practice beyond question the production of abortion.

Syphilis and lead-poisoning during pregnancy receive careful attention. Especially interesting is the question of the father's influence when suffering from plumbism at the time of conception. Tobacco also causes the mother using it to frequently abort. No daring man has as yet traced untold evils to a father who is a confirmed user of the weed. Hysteria and epilepsy and the influence of traumatism are discussed, and the chapter concludes with goitre and "ulcerations" of the cervix. For the latter the editor substitutes "erosions," and adds appropriate remarks concerning laceration of the cervix.

"The Diseases of Pregnancy" forms the subject of chapter ii. The uncontrollable vomiting of pregnancy is studied very minutely. The author has no confidence in dilatation of the external os, but the editor of the book endorses Copeman's method as often of great use, provided the internal os be left undilated. In cases of average severity, but sufficiently grave to justify the trial, the reviewer has seen it beneficial in two out of a number, and in these the relief was sudden and immediate. Between the author and the editor this chapter is somewhat confusing. The author says in regard to dilatation, "We have never obtained any results with this treatment unless it caused abortion;" while on the next page, after describing the treatment of severe vomiting, addressed to the stomach and its assumed dyspepsia, with its high claim for success, he incidentally says, "We cannot accept these conclusions because they do not explain why vomiting should suddenly cease after simple dilatation of the cervix," a thing which he tells us before he has never found successful unless where it caused abortion, and where the relief could not surely be called sudden.

We especially commend the section on cardiac disease as influenced by pregnancy as containing much valuable thought and sound judgment.

Simple œdema, dropsies, albuminuria in its various forms, and the influence of these conditions on pregnancy, occupy considerable space, and lead up to eclampsia. Under albuminuria the author describes the "albuminuria of labor." Following Dumas and others, he restricts the appellation to a condition antedating labor by two or three days at most, ending with that process, and influenced in its severity principally by the duration and severity of labor itself. This condition he believes cannot only be immediately fatal, but "can become the starting-point of a chronic nephritis." The treatment for the albuminuria of pregnancy is "to diminish, combat, suppress this tendency to renal congestion, and bring the blood to its normal condition." To do this venesection is the most powerful means of producing the first result; but purgatives should be first used in "a repeated and constant manner," whatever that may be; and to meet the latter requisition, while tonics, diaphoretics, and diuretics seem indicated, the author believes them hurtful, and recommends a milk diet, giving a diet table so peculiar that we cannot avoid quoting it.

First day, a quart of milk, with two portions of food.

Second day, two quarts of milk, with one portion of food.

Third day, three quarts of milk, with half a portion of food.

Fourth day and thereafter, four quarts, or milk *ad libitum*, and no food or *drink beside*.

The author, while believing this right in principle, prefers, as we certainly should, to give absolute milk diet at once.

Only in exceptional cases would the author recommend the induction of premature labor. He objects to it mainly because he considers that the strain and effort of labor itself is sufficient to often set up albuminuria, and must, therefore, tend to intensify it if previously existing. In this view, however, he is by no means supported by the most recent writers.

In studying the subject of eclampsia the author leans toward the view of Cohen, of Hamburg, as published in 1875, and considers the condition as divisible into two varieties,—uterine and cerebral, demanding different lines of treatment and differing greatly in gravity.

The author's description of an attack of eclampsia deserves to be read by all. The whole section is evidently the result of great research, study, and personal experience. The editor, in opposition to the author, advises the induction of premature labor as a means of prevention when attacks seem imminent before term.

"The curative treatment of eclampsia" and "convulsions not due to eclampsia" will give

the reader many useful hints in regard to the treatment of these conditions. The early evacuation of the bladder is insisted on, since Lamotte cites two cases in which over-distention of that organ appeared to be the exciting cause. Mechanical and manual restraint is condemned. Even auscultation and abdominal palpation should be avoided, if possible, and still more the vaginal touch, which should never be unnecessarily employed. Of course examinations have to be made from time to time, since the progress of labor is often preternaturally rapid. The methods of treatment are classed by the author as the antiphlogistic and anæsthetic. The former embraces general blood-letting, which the author believes should be moderate and rarely repeated, and which his statistics prove to at least have the power of increasing the interval between the attacks; purgatives, which the author employs, especially calomel and jalap; emetics, which he, with revulsives, has entirely discarded.

Pilocarpine subcutaneously the author considers is as yet a doubtful remedy, since it has not been tested alone to any extent. The editor alludes to the hypodermic use of morphine, but neither editor nor author mention the employment of venesection followed by morphine hypodermically. The anæsthetic method seems about as uncertain in its result as the antiphlogistic method. Still, the author considers it as offering the best hope. Ether he rejects. The difficulty with chloroform he believes to lie in knowing when to give it up. "When the patient has gone several hours without an attack, it is best to withdraw the chloroform a little without giving it up altogether." He says, p. 139, "We think that chloroform acts only on condition that its action is prolonged, and therefore it must be given continuously." Chloral hydrate: the statistics of this drug in eclampsia, as here given, are certainly remarkably favorable. The statistics of Tesbut place the mortality from venesection at thirty five per cent.; chloroform, 17.8 per cent.; chloral alone, four per cent. The chloral, owing to the frequency of emesis, should be given by the rectum. The dose of the author is first 60 grains. If this is not wholly or partly retained, a second similar dose is given at once, and a third if the second is lost. Then, for five or six hours, whether attacks come or cease, nothing more is done, and then another 60-grain dose. This 180 grains is generally the limit, but 240 grains have been given in twenty-four hours. Even when they do not recur after the first dose, 60 grains are again given after twenty-four hours. Wherever labor can be terminated by version or forceps, without injury to mother, it should be done. But with a tight and rigid cervix what are we to do? Leave it alone is the author's advice. The section on convulsions not due to eclampsia deals with neuralgias, nervous troubles from mechanical causes, of central origin, reflex, vertigo, syncope, paralysis, hemiplegia, cerebral congestion, cardiac affections, paraplegia, traumatic paralysis and special paralyses, intellectual disturbances, and is followed by a section on mania and allied disorders.

In treating of pruritus vulvæ the author gives a number of formulæ, but fails to recommend the salicylates, which should always be given a trial. The editor adds a few lines in regard to the benefit often derived from applications to the often eroded os.

Two excellent chapters—on "Diseases of the Womb" and "Diseases of the Fœtus"—are followed by one on "Miscarriage." This, while quite full and abounding in research, exhibits the author's own view in regard to the treatment of this condition, a view in which we think few will coincide. He advocates a perfect let-alone policy in retention of the placenta and membranes. The editor comments in language none too severe upon the dangerous advice given by the author, whose own strictures upon active interference, and especially the use of the curette, are of no gentle character.

But while one may differ at times from the author's conclusions, he at least possesses the merit of giving the reader the premises from which he deduces them, and the reader, with the evidence before him, may come to conclusions diametrically opposite if he will.

E. W. W.

OXYGEN IN THERAPEUTICS: A TREATISE EXPLAINING THE APPARATUS, THE MATERIAL, AND THE PROCESSES USED IN THE PREPARATION OF OXYGEN AND OTHER GASES WITH WHICH IT MAY BE COMBINED, ALSO ITS ADMINISTRATION AND EFFECTS. Illustrated by clinical experience of the author and others. By C. E. Clevinger, M.D.
Chicago: W. A. Chatterton & Co., 1887.

The author has evidently thought much on this subject, and been much vexed at heart, no doubt, at the apparent success of the empiric, who has flourished under his eye like the "green bay-tree." He has watched, perhaps, the "compound oxygen parlor" from its modest beginning in some by-street and humble house to its full development in a truly

palatial edifice, adorned with works of art, flashing by night with electric lights, gilding, and cut glass, and his heart has been seared with envy. The envy of the righteous was the success of the wicked, a feeling as old as the time of David, as old as man, historic or prehistoric. But the author's broodings have led him to investigation. What is it? Does it really succeed? and how? Can any one use it? The affirmative answer to the last question is, if it can be given, the panacea for the envious. They can do it, if they wish. But, then, they do not care to do it. Let the other fellows reap what success they may.

The author is familiar with chemical manipulation, and gives us minute and excellent directions for preparing the gases. Few in active practice could take the time and trouble. The dentist, however, has solved this part of the problem to his own satisfaction and profit.

The author gives us a list of the diseases in which inhalations of oxygen and compound oxygen—oxygen and nitrous oxide gas—are useful. The list is very long. It includes hydrophobia and fatty placenta, septicæmia and ulcers; in short, almost everything; and, after reading it, we are disposed to think more kindly of the advertisements of the present purveyors of this remarkable remedial agent. E. W. W.

Correspondence.

LONDON.

(From our Special Correspondent.)

It seems but the other day that I wrote to you at the beginning of the winter session, and here we are about to commence the summer's work at the medical schools. This is the season appointed in London for the study of pharmacology and therapeutics, the English schools, as a rule, differing in this respect from the Scotch universities, where materia medica constitutes a long winter course. If I attempt to give you some account of the teaching of your special subject in London, I fear you will not be altogether convinced of the success that is likely to attend the system. No doubt matters have mended very much in the teaching of materia medica during recent years, but still the entire provisions for this course must be regarded as being unworthy of its importance. The more one inquires into this matter, indeed, the more one feels dissatisfied, and the more one sympathizes with our lecturers on materia medica, who, as a class, are known to labor under great difficulties in their efforts to assert a better position for their chairs. In my letters to you I have avoided, as far as possible, committing myself to the present chaos of what with us goes by the name of "medical politics," or that part of medical politics which relates to the State provisions for the proper education, examination, and registration of medical men. I have felt that such a state of affairs as that from which we are now suffering here is never likely to arise with you, and that you may well be spared the infliction of the story of our struggles for reform. But when I come, as I do now, to speak of the teaching of pharmacology in England, I find it necessary to depart somewhat from my rule and to refer to recent changes in the regulations of our examining bodies.

Know, then, that within the last three years an honest and determined effort has been made by our two great royal colleges in London, the College of Physicians and the College of Surgeons, to give in union a single, a thorough, and a complete examination in all medical and surgical subjects, instead of the fragmentary, unsatisfactory tests that were previously in force. New examinations entailed new regulations as to the course of study. Now, however unhappy the confession may be, it is a fact that systematic instruction in medicine at our schools must always be conformed to the demands of examinations. Students must be taught what they are required to know at the examination table, whatever their professors may think. It is hopeless for a teacher with a turn for originality to strike out a new line in his lectures, whether on materia medica or on anything else. His students would certainly be rejected, and he would soon find himself compelled to return to the beaten track of the college schedules. Reform, therefore, must begin with the examining authorities. The lecturers have to use their influence with the examining boards to secure proper regulations and then teach up to them. But here comes the rub. What does the influence of modern pharmacology with us amount to? How were our lecturers on pharmacology to obtain anything like a reasonable recognition of the importance of their subject from the venerable heads of the venerable colleges? What could be expected in this direction of public men who were mainly educated in the days when instruction in pharmacology began with a mass of botanical, geographical, and chemical details, and ended with a col-

lection of empirical cut-and-dry applications of drugs known as their "therapeutics"? The difficulty would appear to have been to bring the heads of our examining bodies to understand that there is such a subject as pharmacology, relating to the action of drugs on the healthy body, quite apart and distinct from medicinal therapeutics, the treatment of disease with remedies.

However, difficult matter as it must have been, the colleges have been induced to take one step in reform which is of the first importance. Although they still cling to the phrase "medicinal action" in their requirements of students of the first year, they have separated materia medica from therapeutics in the examinations, the second subject not being required of the candidate until his final appearance before the board, when it is taken with medicine, surgery, and midwifery. For this great improvement the colleges deserve all credit.

Now let us inquire how our lecturers have taken advantage of these new and better regulations. I regret to say they do not appear to me to have availed themselves of the reform for which they agitated. The plan on which many or even most of them seem to deal with their subjects appears to me to be far from satisfactory. Whilst they agitated, as I have said, for a distinction between pharmacology and therapeutics in the examinations, I question how many of them, to judge by the accounts that reach me, have divorced the ill-matched pair of subjects at the schools. I fear that a course of materia medica and therapeutics in the average London school of medicine still consists of an hour's systematic lecture four or five times a week, an occasional demonstration by the lecturer or his assistant of the physical characters of the principal drugs, and a general superintendence of a class in pharmacy in the hospital dispensary, of which the student may or may not avail himself. To begin with, the time devoted to the whole course—some forty hours, from first to last, in the way of lectures—is ridiculously short. But the improvement that appears to me to be most urgently demanded is what I have just called the divorce of materia medica from therapeutics. The time has surely come for us to cut these subjects clean apart and give them to different lecturers. It is not only that professors like Dr. Lauder Brunton and Dr. Frederick Roberts might well be released from the drudgery of materia medica, but that the knowledge of men of their learning and experience ought to be turned to very different account in the direction of a thoroughly practical course of therapeutics. But I must not be unjust. I understand that at some of the smaller hospitals a beginning has actually been made of the kind I have indicated, and that their senior students will now have an opportunity of listening to lectures on general therapeutics concomitantly with their work in the wards. It is certainly but a question of time, the establishment of instruction of this kind in all our schools of medicine.

Before I part with this subject let me tell you that the hope has been realized which I expressed to you in my letter of December, of the establishment of the Croonian lectureship on a basis favorable to therapeutics. The College of Physicians has now made the final arrangements for the future disposal of the trust money. This will amount to the handsome sum of over two hundred pounds a year, one hundred guineas of which will be paid to the lecturer, whilst the balance will be devoted to defray the necessary expenses.

I will pass on now to a question of treatment of a very different kind. No doubt American practitioners are aware that our government appointed a committee, a good many months ago, to inquire into the value of Pasteur's method of inoculation against hydrophobia. There was something like a hydrophobia scare in England most of last year, which had its origin not so much in the actual increase of the disease as in the severe restrictions with regard to muzzling dogs which were enforced by the London police, and which roused popular feeling to a wonderful pitch, fortunately in vain. The government committee is a very strong one, including as it does Sir James Paget, Sir Joseph Lister, Sir Henry Roscoe, Dr. Quain, Dr. Burdon-Sanderson, Dr. Brunton, Mr. Fleming, and Mr. Victor Horsley acting as secretary. The task of the committee is undoubtedly difficult,—to pronounce an opinion on the Pasteur system which shall be a practical guide to the authorities in this country. We need not be surprised, therefore, that so far no report has been issued. The committee might at once have hastened to express an opinion on the subject, but such an opinion could manifestly have been of a preliminary character only, and most probably would have been erroneous and misleading. Not only must the results of this as of every other method of treatment be weighed with the greatest care and caution, but in this particular instance so-called results could be of no

possible value until a period of many months had elapsed after the application of the remedy,—until, in a certain number of test cases, at least the average period of incubation of hydrophobia had been passed. However, I hear on good authority that we may expect a report shortly. The committee has not been idle. Mr. Horsley has studied the method as well as the records in M. Pasteur's laboratory. He has been provided with a list of various series of cases of bite that have been treated in Paris. On the results of their inquiry into these series the report of the committee may be expected to be distinctly favorable, as well as on the results obtained by evidence of other kinds. I understand that the committee have arrived at the conclusion that the percentage of deaths from hydrophobia after bites of rabid dogs is decidedly lower in inoculated persons; that the system has been proved to be protective. With respect to possible danger from inoculation, I must refer to a fatal case of Landry's paralysis, or acute ascending spinal paralysis, which occurred here in one of Pasteur's patients, and caused considerable discussion at the time. The patient in question, who was an attendant at the Brown Institution for the Study of the Diseases of Animals in London, had been bitten by a rabid cat, in which Mr. Horsley, the professor superintendent, was studying rabies. The man had been at once sent to M. Pasteur, and treated with *intensive* injections, but he died with perplexing spinal symptoms immediately on his return from Paris. Whatever may have been the exact nature of his illness, there was a general impression among the profession here that the patient died from the effects of the inoculation, as a few other cases appear unfortunately to have done. However, risk will probably disappear under the milder injections now used.

It is most sincerely to be hoped that the favorable report which I expect from the committee may bear the test of time. Were it only for Pasteur's sake, one would rejoice to see the value of his method accepted. From first to last he has been a pattern of generous, open, kindly dealing with regard to it, receiving strangers from every country with the greatest possible attention and consideration, laboriously treating half a hundred patients every morning, and entirely declining to accept any remuneration or other return than thanks for his trouble, even from those who were in the best possible position to pay for his services.

PARIS.

(From our Special Correspondent.)

The Paris Faculty has of late been paying a heavy tribute to death. Barely more than three months since Professor Béclard was carried off by acute pneumonia. Next Professor Gosselin, the celebrated surgeon and scientific successor of Velpeau, succumbed on April 30, a victim to a cardiac affection of long standing. And now we have to record the death of another professor of equal renown, but younger than either of them. A. Vulpian, a native of Paris, like his two brother professors, died on May 18, after a short illness from infectious pneumonia contracted at the dissecting-table. He was born in 1826, graduated in 1854, and became a Fellow (*agrégé*) of the Faculty in 1860, with a remarkable thesis upon Secondary Pneumonias. After being a physician of the Salpetrière and Pitié Hospitals, his researches on the nervous system caused him to be chosen, in 1867, for the chair of pathological anatomy at the Paris Faculty of Medicine. A bitter campaign was made against him by antagonists, who accused him of atheism and materialism. At the time—under the empire—such doctrines were not favored; but now, under the third republic, they rather lead to preferment. It is hardly necessary to add that the charge was neither proven nor even answered, and Vulpian was the medical attendant of the Comte de Chambord (Henry V.) during the last illness of the champion of the right divine and papal supremacy. Dr. Vulpian became a member of the Academy of Medicine in 1868, of the Academy of Sciences in 1879, the President of the Faculty in 1875, and the Perpetual Secretary of the Academy of Sciences in 1885. His labors as an investigator were chiefly directed towards the anatomy and physiology of the nervous system. Among his published works are his "Lessons on the General and Comparative Physiology of the Nervous System," "Lessons on the Vaso motor Apparatus," and "Affections of the Nervous System." Professor Vulpian was justly esteemed for rigorous method and exactness of observation as an investigator and keenness of diagnosis as a physician. He was a most ardent supporter of Pasteur's theories, and the one who decided him to attempt for the first time on man inoculations with attenuated rabic virus.

But though professors and scientists may die, the field of science in Paris hardly looks likely to run to waste owing to the lack of workers, as may be seen from the gleanings

below. To begin with therapeutics, methylal will be the first noticed.

Methylal as a Hypnotic.—Methylal is a substance comparatively long known to chemists as one of the products of the oxidation of methylic alcohol. It is an ethereal liquid boiling at 42° F., smelling like acetic ether, and soluble in three times its weight of water. Messrs. Mairet & Combemale have been studying its physiological and therapeutical actions, and now offer it as a new addition to the list of hypnotics, after presenting its credentials in several communications to the Academy of Sciences. Experiments were first made on animals to investigate the physiological properties of the chemical, its doses, best way of exhibiting, etc. It was found that no matter how administered, hypodermically, by the lungs or the stomach, methylal acts as a true hypnotic, and the more so that the animal operated upon is nearer to man. A monkey, for instance, is set to quiet sleep with half the dose necessary for a dog or a cat, while guinea-pigs pass from a somnolent to a half-comatose state, according to the dose, without ever enjoying real sleep. The proper method of administering the chemical is through the stomach. Hypodermic injections are quite painful and apt to produce ulcerations; inhalation or pulverization are irritating to the lungs and nasal membranes. On the contrary, the ready solubility and far from unpleasant taste of methylal render it easy to administer in any ordinary potion or mixture, although the effects are not so rapid as with the two other modes, especially the hypodermic, but they are more persistent.

On man methylal acts as a hypnotic, and seems to be more particularly adapted to certain forms of dementia. It was tried with thirty-six insane patients suffering from nervous agitation and insomnia. In all cases it was given immediately before retiring, at one dose, in an ordinary potion (*julep simple*). The patients never showed any repugnance to the medicine, nor was any organic trouble caused by its use continued for some time. The following are the particulars of its effects in the different forms of insanity. In incipient madness (*folie*) methylal has no hypnotic action, even when the dose is increased to 7 and 8 grammes (1¾ to 2 drachms), but during the periods of acute agitation it generally succeeds at first in procuring sleep in doses of 5 or 6 grammes. The effect, however, wears off in from three to five weeks, even when the dose is increased. The same is true with patients suffering from simple dementia. In alcoholic mania methylal is unsatisfactory, and is not recommended. In dementia from atheromasis small doses of 3, 4, and 5 grammes procure sound and continuous sleep for the first five or six nights, but after this period, even with increasing doses, the sleep, as in simple madness, becomes less thorough, and lasts only some five or six hours. It is in paralytic dementia, at its different stages, that methylal gives, as a rule, the best results, in doses varying from 5 to 8 grammes. It is also in this form of insanity that the medicament keeps its power for the longest period without an increase of quantity. The *julep* or *potion simple* of the French Codex, alluded to by Drs. Mairet and Combemale, is made as follows:

> Simple syrup, 30 grms. (1 ounce);
> Orange-flower water, 20 grms. (5 drachms);
> Distilled water, 100 grms. (3½ ounces). M.

The methylal is administered simply dissolved in the mixture, but it must be borne in mind that in all cases the quantities indicated must be understood by weight, and not by measure. With a liquid of sp. gr. 0.8551 like methylal, a fluidounce is quite different from a troy ounce.

To conclude with methylal, it appears to possess exclusively hypnotic properties. Its effects on the brain are transient and leave no depression. Even after being administered for fifteen consecutive days, no troubles of nutrition, of the general functions, or of the nervous system were observed. For these reasons, notwithstanding its relatively weak power, methylal is recommended as a safe and reliable hypnotic in some forms of insanity.

Elimination of Formiates.—The chemical similarity of formic and acetic acids might lead physiologists, *a priori*, to think that formiates are most likely decomposed in the economy in the same manner as acetates are, and in the same way are eliminated as carbonates. But experiments carefully made by Drs. Gréhant and Quinquaud prove that the combinations of formic acid show in the economy a resistance to decomposition quite unexpected to chemists. The most difficult part of the investigation was the estimation of formic acid. In the absence of a better method, Drs. Gréhant and Quinquaud were obliged to employ the distillation process, *in vacuo*, in the presence of an excess of sulphuric acid. Analytical chemists, who like nothing so well as a readily-collected precipitate, know the tediousness and difficulties of

distillation processes. But it seems there is no choice in the matter. Experiments made upon dogs, frogs, and pups show that when ingested into the stomach, or injected into the blood, *formiate of sodium* passes off mostly through the urine, without the slightest decomposition. No excess of carbonates is found in the urine during the administration.

Ether-drinking is almost unknown in Paris, the natives having as a rule no propensity for intoxication of any sort, although the trade in wines and liquors is as free as that in tea or ready-made clothes. Whether such freedom is the cause or the result of moderation in drink is a question that may be left to moralists to decide. However it may be, a case of *ether-poisoning* reported by Dr. E. Ory has attracted notice, owing to some of its features. The patient, Mr. X., is a Japanese, age 35, of small stature, spare, and very nervous. Being a dyspeptic he began, to ease his pains, to inhale ether; then to take from time to time ten drops or so in water,—so runs his story,—and finally one day, for some reason or other, he swallowed at a dose a quantity of ether not exactly ascertained, but in no case less than fifteen grammes (half an ounce by weight). After this draught, mixed by himself with sugar and water in a café, he took a cab and drove home. Judging from the distance, at least half an hour must have elapsed before he could have reached his rooms. There his wife only noticed he was somewhat strange, acting like a man slightly inebriated; when, after sitting a short time, he suddenly ceased to speak, and fell into a comatose state. From red his face turned pale, he vomited some aliments, and fell into a syncope. The ether had been swallowed at 4.30, the syncope occurred at 5.30, and it was 6.30 before Dr. Ory could reach the patient's bedside. The diagnosis at first was somewhat perplexing, when, on attempting to induce artificial respiration, the smell of ether, hitherto covered by that of the ammonia, vinegar, etc., used by the attendants, became distinctly recognizable in the mouth, and gave a clue to the cause of the swooning. There was no longer any hesitation as to the treatment,—the usual one in such cases. Rough frictions were ordered, the windows opened, and artificial respiration was resorted to. An enema with 8 grammes (2 drachms) of acetate of ammonium was prescribed to ward off a relapse of the prostration. Not to enter into all the details of the treatment, suffice it to say that after a short amelioration the physician was called in again, and had to resort again to artificial respiration. The total duration of the anæsthetic sleep was twelve hours, and of the phenomena depending upon the action on the medulla,—abolition of the respiratory and heart movements,—four hours. During several days the urine was more or less abnormally colored, intensely dark brown at first, and gradually toning down to the natural hue within about four days. The icteric coloration of the skin and sclerotic, manifest at first, slowly passed off also in some ten or twelve days, when the patient resumed the orthodox Japanese color. A persisting congestion of the lungs was also observed. The patient kept his bed for fifteen days, and, owing to extreme and obstinate anæmia, had to remain in-doors for three months and a half before going out for the first time. Dr. Ory, agreeing with Dr. Morewood, of Draper's Town, thinks it was artificial respiration that saved the life of his Japanese patient.

Physiological Effects of Earthquakes.—At a recent meeting of the "Société de Médecine Pratique," an association composed of both physicians and pharmacists practising in Paris, Dr. Duchaussoy related his medical experience with the peculiar effects of the late earthquakes at Nice, Cannes, and Mentone. Among the immediate consequences he noted three cases of metrorrhagia, one of which occurred in a woman who had ceased to menstruate four years before. Sea-sickness he found quite common. Several women became suddenly insane; but one who had been ailing six months from paralysis was cured immediately. Patients with heart-diseases suffered most, many experiencing violent fits of palpitation, while several sudden deaths were recorded. A few ladies who bravely stood the morning shocks had a violent fit of fever in the evening.

The consequent or secondary effects were no less striking. A vague feeling of dread was common; many persons could not go into their bedrooms in the evening and lie down for the night. Some had for days a periodical recurrence of the trouble experienced during the earthquake, a recurrence accompanied with copious perspiration, loss of hair, failing appetite, and extreme weakness. One, especially, a lady, more than thirty-five days after the accident, was still so affected that she could not see a piece of furniture oscillating without great involuntary terror. Dr. Brochin's opinion was that the case of paralysis, quoted by Dr. Duchaussoy, was probably of hysteric origin, as he (Dr.

Brochin) had occasion to observe an effect just contrary in an hysteric young woman who had experienced no fits for several months, and in consequence of the earthquake was taken afresh with numerous fits following one another. Dr. Ley finally related a case of sudden death from heart-disease. The patient, a lady, would certainly have lived longer had not the emotion caused by the earth trembling brought her case to an abrupt termination.

Tuberculosis from Whey and Cheese.—That the milk of cows affected with phthisis may propagate the disease among the consumers is a fact now generally admitted. But M. V. Galtier goes a step further, claiming that even the whey and cheese made from such milk are liable to communicate tuberculosis. In a memoir presented through Dr. A. Chauveau to the Academy of Sciences, he has marshalled quite a convincing array of experiments upon rabbits and guinea-pigs to prove the dangerous nature of such aliments. Not that he followed the long and tedious process of feeding the animals with the products. He simply inoculated them with small quantities made from milk known to be contaminated, and thus caused unmistakable tuberculosis, even with cheese that had been made for over two months. From his experiments he has come to the conclusion that germs of tuberculosis are to be found not only in the fresh milk of cows affected with phthisis, but also in the dairy products derived therefrom; the germs remain both in the curd and the whey; so that man can most likely contract tuberculosis from the fresh milk as well as the curd, the whey, and the cheese even salted, which proceed from a consumptive animal. Poultry and swine fed with buttermilk of like origin are also liable to become phthisic, and to such cause the disease in farm-yard animals may in many cases be with reason attributed. Finally, the milk produced by cows suspected of tuberculosis should in no shape be used for human consumption, but only for feeding animals, and even then after thorough ebullition.

PARIS, May 21, 1887.

BERLIN.

(From our Special Correspondent.)

During the week immediately following the Easter holidays there occurred two of the most remarkable Congresses for German medicine,—the Congress of the German Surgical Society in Berlin and the Congress of the Society for Internal Medicine in Wiesbaden.

If I were to attempt to describe the amount of material which appeared and was discussed at these Congresses, the choice would be most difficult, as it would be impossible to confine all that is instructive and interesting within the narrow limits of a letter, and I cannot think your readers would be satisfied with only a description of the themes under discussion. I therefore prefer to make a selection of those which seem to me most suitable for your journal, giving them a thorough report and only touching lightly upon the others.

The German Surgical Congress has had fifteen meetings before this one, and a large part of the history of surgery owes its existence to the transactions of these meetings. We see the great change brought about in surgical practice by the theories of Lister, and the German Surgical Congress has not only had the greatest influence in the development of these theories, but the rapid adoption of them is less Listerism than the skilful absorption of them by such men as Volkmann, Bardeleben, Thiersch, Esmarch, and others.

The Surgical Congresses of seventy years bear testimony that the Lister system, as well as operative surgery, owes to them its greatest development. Nearly every German Surgical Congress has produced some remarkable progress, the entire completion of which we have not yet reached, but this tradition has not been sustained by the impression made upon us by the meeting this year; there seemed to be something lacking. It is true there were many cases discussed, but there failed to be anything decisive upon any question. The only subject which led to a discussion of great value was the treatment of peritonitis by laparotomy, but which had no satisfactory conclusion; that, however, was in the nature of the case. We will not leave this subject, however, without mentioning the vindication of iodoform as an antiseptic, in spite of the attacks made recently upon this valuable remedy by the Danes Heyn and Rovsing. Not only were good practical results testified to, but theoretical experience refuted the objections made by the above-mentioned authors. We may, therefore, rejoice that this medical treasure remains as a valuable remedy, of which, unfortunately, there are only too few.

If we confine ourselves to a short account of the proceedings of the Surgical Congress, on the other hand we must be more diffuse in our account of the Congress for Internal Med-

icine. This Congress was established in 1881 through the influence of Leyden, and received from the beginning an organization which guaranteed its importance for the future. The principal object of the meetings is the general discussion of important questions upon internal medicine, as far as they are known, that an opinion may profitably be obtained. These discussions are most carefully prepared. Two authorities introduce a given subject, and as it has become the custom to hear the opinion of every competent authority upon the matter under discussion, a really exhaustive decision is obtained, as not only the most celebrated physicians of Germany, but also of other countries, regularly attend the Congress. We can, therefore, assert that this Congress is the heart of the scientific research in Germany.

There were three subjects under discussion at the Congress this year. One, the localization of diseases of the brain, we shall not describe, as it does not come within the scope of your journal. The second subject, the pathology and therapeutics of whooping-cough, was decided by all to have made no advance that was at all remarkable during the last twenty years. The third subject was the therapeutic treatment of phthisis, and on this subject we will speak more particularly.

When the Congress met for the first time five years ago, it was most natural, from the effect of the discovery made not long before of the tubercle-bacillus by Robert Koch, that there should have been a discussion upon the results his discovery would have upon the treatment of diseases of the lungs. The great importance of Koch's researches upon the etiology and diagnosis of tuberculosis was unanimously recognized then. Since that time there have been a series of attempts to derive some benefit from them for the therapeutics of consumption. Only too soon one had to realize the fact that to attack the tubercle-bacillus with substances fatal to the bacillus in the human body was impossible, because all these substances destroy the living cell in which the bacillus has its place. This fact, therefore, was unanimously established this year by the Congress,—*there is no specific remedy for pulmonary consumption.* All medical treatment can only be against certain symptoms of this complicated disease. For the actual cause of the organized disease there is no cure.

Apart from the negative result arrived at, the general knowledge of this fact would save many diseased from much suffering from the application of all kinds of useless medicines could it be proved that the discovery of the tubercle-bacillus had been without benefit therapeutically. This, however, is not the case. On the contrary, it has made it possible to institute in another direction careful investigations for a rational treatment of consumption, and especially for prophylactic treatment of phthisis.

If we take the position of endeavoring to prevent the spread of phthisis from the standpoint of the tubercle-bacillus, in its relations as a living organism, as the cause of this disease, the solution of the problem may be attained in two ways: we may endeavor to destroy or render inert the noxious agent itself, or we can give all our energies to preventing its entrance into the human organism.

The first undertaking comes within the province of hygienic science in its widest sense; the disinfection and care of buildings, lodgings, food-stuffs, clothing, all afford a field, the limit of whose relationships it is hard to define; but as prophylactic and disinfective measures have given such good results in other fields, we should never lose sight of the possibility of like success in the prevention of this greatest scourge of humanity.

In the hygiene and prophylaxis of the individual we have efficient means to prevent the direct transference of tuberculous poison. The prohibition of intimate association with the phthisical in the act of kissing; the disinfection of the sputa; the careful cleansing of soiled clothing; the careful segregation of such patients,—all these precautions are ordered, unfortunately, by but an occasional physician. And at present a successful protection against phthisis may be said to have been more commonly accidental than the result of intelligent effort. The transmission of tuberculous poison by the media of tuberculous meat and milk has been clearly demonstrated; and hence the necessity of careful supervision of slaughter-houses and a thorough examination of meat.

We come now to the second question, How can we prevent the entrance into the human body of the cause of phthisis? Now, those must be considered who inherit the tendency to phthisis, and sooner or later will be liable to have it. It is just these who are to be protected, even before their entrance into the world, from the slightest chance of infection, by preventing their being nursed by phthisical mothers or wet-nurses, sleeping with phthisical persons; the care of such children by phthisical attendants and servants is to be

strictly avoided. Through careful nourishment the resistance of the body is increased, and the choice of an occupation which will allow being much of the time in the open air is of the greatest importance. Among all these prophylactic measures there are many which can be carried out with a fair hope of success, and we need not sink helpless before the enemy. But when, in spite of every effort and care, the disease has penetrated into the organism, in spite of the above assertion that there is no medicine known which will cure phthisis, we must not feel hopeless for those who are already invaded by the poison. To the question, Can phthisis be cured? there was no contradiction. It cannot be denied that the sacrifices are great with which the cure must be bought. For the very reason that recovery is possible, the physician must inform his patient of the seriousness of his condition. The first thing necessary is the hearty co-operation of the patient; then the slightest deviation from the mode of life prescribed lessens the probabilities of permanent cure. To attain this the *hygienic dietetic* method was recognized by all. The details of this method must be determined by the physician and the circumstances of the patient. Fresh air, protection against taking cold by rational clothing and care of the skin, a regular diet. In the latter great caution against overstepping the prescribed rules. The doctrine that some places are, geographically and geologically, better adapted to consumptives than others, was not received without contradiction from the opposite side. A strict treatment in an institution was almost unanimously recommended for those liable not to persevere in a strict course of cure. Those patients, however, who are able to seek a favorable climate, or who can afford care in an institution, belong to a very small class, and the number of those persons of small means and the very poor is very large, therefore there is a great necessity for more consumptive hospitals. The care in an institution, which might be situated either near a forest or in the middle of a large garden, would combine many of the requisites to a cure. Surely a great blessing would attend the sacrifice of carrying out this thought.

The short *résumé* which we have endeavored to give could not, of course, touch upon many subjects which were mentioned by Drs. Dettweiler and Penzoldt, who so ably conducted the discussion. We have only tried to lay before you the great features of the position taken by German medical science at the present time upon so important a matter. If phthisis will be cured in some other way by therapeutics is still a question of the future. It is not yet decided that phthisis cannot be fought by some other more direct treatment, but so much has been undoubtedly been decided by this year's Congress for Internal Medicine: there is no reason for our folding our hands in idleness. With a clear knowledge of the cause of the disease, which we owe to the discovery of Koch, a new impetus has been received by the physicians. What is now within our power has been clearly demonstrated by the discussions of the Congress, and great responsibilities are laid upon us, the accomplishment of which lies with many self-sacrificing workers.

Death has been at work in Berlin among the German medical philosophers with great force this year. In the last few weeks two well-known and learned men have died whose names are not unknown in America. One is Wilhelm Hack, whose theory of the erectile tissue upon the turbinated bones created so much interest some years ago. He died from heart-failure, while riding a velocipede, on the 23d of April. The second is the pathologist, Carl Friedländer, a name connected with many valuable researches, but chiefly with a discovery bearing his name, the pneumococcus. He died at Meran, on the 13th of May, of phthisis.

SANTONIN-POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—On pages 209–11 of the March number of the GAZETTE is to be found a correspondence from Paris, in which are mentioned some points on "santonin-poisoning" of great benefit to the physician. I have seen nothing on this subject for years, and have often wondered if physicians ever were troubled as I have been with this much-lauded drug, santonin.

If American physicians happen to poison their patients with this drug, they either do not care to publish it, or do not take interest enough in the matter to do so. I have used santonin for seven years in quite a number of cases, and have had some ill luck with it.

The first case of poisoning with it was with one of my own children, a little girl of 6 years. She presented every symptom of worms, and I thought that I would give her santonin. I gave 2-grain doses, morning and night, for two days and nights, taking care to keep the bowels moving every day. On the morning

of the third day I was sent for in haste by my wife, as the child was having convulsions. There had been three convulsions before my arrival, and only one after. My wife had given a large dose of castor oil as soon as the child could swallow it. The bowels moved freely in two or three hours, and the symptoms of convulsions were all over. Sixty odd large worms were expelled within twenty-four hours.

I thought for a day or two that it was only the worms that produced the convulsions, but I noticed the conjunctivæ were of a yellowish-green color, and the child could not see well. After a few days the eyesight got all right.

The second cases were in the year following, 1881. Two children in one family were treated for worms by the mother, under some directions from their family physician. On the third morning I was called to see the children, "with fits," as they called them. Stimulants internally, heat to the extremities, a copious enema, and such measures as were calculated to keep up the circulation, were used.

The kidneys were secreting but little urine. The pupils were dilated.

After some hours' work the bowels moved and kidneys acted well, and the children got up, but no worms were passed.

The drug had been given in these cases in conjunction with calomel and sugar. I do not know in what amounts.

The next case was a little boy, 7 or 8 years old. He was taken ill during my absence, and another physician was called to see him, and he gave calomel and santonin. Three doses, 3 grains of the latter to 4 or 5 of the former.

The bowels never moved for forty-eight hours, and as soon as I arrived home I was called to see the little fellow. His limbs were flexed, bathed in cold sweat, pulse 150 to 160, respirations jerking, pupils dilated, jaws set, abdomen swollen, and comatose nearly all the time. I could do but little. Stimulants rubbed on the spine, plenty of warm water and soap enemas, poultices to the abdomen, blister to the nape of the neck, etc. After a while the bowels moved copiously; green offensive matter.

At the end of five hours he could talk, move, and swallow water. The urine was very scanty and high-colored. By the use of diuretics his kidneys assumed their normal functions.

I was indeed very much puzzled over this case until I found that the child was very nearly blind for over a week. Everything was yellow to him for some ten days. Having seen in the "National Dispensatory" that blindness had been produced by santonin, I could better account for the great disturbance.

I have seen many other cases that were similar to the above, but not so severe.

I find it will not do to give santonin to children while they have high fevers, or when the bowels are costive. If given with castor oil and sugar mixed together it does much better.

I have little doubt but that through the indiscriminate use of the drug by parents and physicians many children are killed by its effects.

I would be pleased to see the reports of other physicians on this drug. If we have bad results, let us report them as well or more so than our good success, for by so doing we will benefit mankind.

Very truly yours,

CHEVES BEVILL, M.D.

WINFIELD, ARK.

CUTANEOUS DISORDERS FROM INDIGESTION.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In your reply to my query in the March number of the GAZETTE, page 212, you call the disease to which I referred *urticaria*, and so headed my article for me. I think likely I did not make myself well understood, as you missed the mark in the heading, and also failed to answer the particular point about which I was wanting information. I quote my language: "Now, what I want to know is, why this disturbance of the stomach is telegraphed by the nervous system to this distant locality and nowhere else?" I fully endorse your remarks on urticaria, as also those of Dr. H. D. Thomason in the April number of the THERAPEUTIC GAZETTE. The subject of my query has none of the characteristics of urticaria; none of that heat with burning and stinging sensation, giving it that significant name, nettle-rash; none of those nodulated or elevated wheals or patches; nothing visible to the naked eye, however much rubbed or scratched, and it is confined to the legs; sometimes in spots, and sometimes extending over the whole surface from the knee- to the ankle-joints. And I said at middle age, but I will add at any period of life beyond this. I have never heard a woman complain of it, while they frequently consult me about nettle-rash; and I agree with Dr. Thomason that, according to my ob-

servation, they are more frequently troubled with it than men, and I think there are obvious reasons why they should be. If I were going to name the subject of my query I would call it "Pruritus senilis," but I am no stickler for a name. I thus hastily write the above explanation for insertion in the GAZETTE because I think I was misunderstood by you, and by your reply to my query Dr. Thomason was misled, as would be all other readers of your valuable journal.

R. L. HINTON, M.D.

PRESCOTT, NEVADA CO., ARK.

[The case described by Dr. Hinton would rather come under the name of pruritus than urticaria, as we meant to indicate in our comments on the article. The method of production of the eruption, in our opinion, is precisely the same as in gastric urticaria, and we supplied the title of "urticaria from indigestion" as representing the most familiar example of eruptions so produced.—EDS.]

THE NEW TREATMENT OF PHTHISIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—In an article in the GAZETTE for April 15, Dr. Wood refers to the difficulty with Bergeon's method of treatment of phthisis in private practice, in the cumbersomeness of the apparatus and the skilled labor required for the preparation of the gas.

It seems to me that these objections are obviated in the following described plan, which was devised and has been in use by myself for several weeks: A so-called soda-water bottle is charged at the factory with carbon dioxide, connected by a rubber tube with a Wolff-bottle partially filled with water saturated with pure hydrogen sulphide, and the Wolff-bottle again connected with a rubber bag having a stopcock. Pressing gently upon the lever of the soda-water bottle, the carbonic gas is forced through the sulphurous water, carrying the combined gas into the bag. When the bag is filled the stopcock is turned, a rectal nozzle is introduced, and the bag carried to your patient all ready for treatment.

My patients send for these bags and administer the gas to themselves after two or three lessons. Knowing the size of the bags, you can regulate the amount of gas used at each séance. The sulphurous water should be renewed after being used to fill a three- or four-quart bag two or three times. At ordinary temperatures the carbonic gas will take up sufficient hydrogen sulphide in a bulk of three or four quarts of the combined gases for its safe use.

A decided collapse was caused in one of my cases by using six quarts of the gas as made above. My patients taste the sulphur soon after its administration, and continue to do so for hours. In about forty administrations it has been rejected but once. After introducing the rectal tube I press gently upon the bag, and after a minute or two the gas will pass in rapidly, causing a little colic; then I turn off the stopcock and wait a minute or two and turn on again.

This treatment has a marked effect in relieving the septic phenomena, chest-pains, dyspnœa, and diarrhœa. The sputa lessens in amount, becomes thinned and yellowish in color.

Again as to the apparatus, should there not be a soda-water manufactory at hand the carbonic gas can readily be generated and stored as proposed in a large rubber bag, and from this forced through the sulphur-water into the visiting-bag as required. The sulphur-water may be prepared by the druggist or the physician at his leisure, or the druggist himself may fill the administering- or visiting-bag upon prescription. Will not this plan meet the objections of cumbersomeness and the necessity of skilled labor at the bedside?

BYRON H. DAGGETT, M.D.

258 FRANKLIN STREET, BUFFALO, April 30.

GELSEMIUM AS AN ANTIDOTE TO OPIUM-NARCOSIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—From the known physiological effects of gelsemium and my own experience in its administration, I came to the conclusion that it would prove an antidote to the lethal effects of opium, but had no opportunity of testing its qualities in this respect until July 26, 1885, when I was hastily called to see Mr. Frank C., a young man residing about two miles from this city, who had about two hours previously swallowed an ounce of laudanum with suicidal intent. I found him profoundly comatose, pupils contracted to a pin's point in size, face turgid and dusky red, carotids pulsating violently, so much so as to jar his head, respiration slow, etc. Having no stomach-pump, and not feeling safe in using apomorphine in his condition, I titillated his fauces, placed 2 scruples pulv. ipecac between gums, lips, and cheeks, gave him the bastinado, castigated bare legs and rump with

a handful of switches to near vesication without results. Stertor becoming more profound, I determined to test the virtues of gelsemium, and gave hypodermically 25 minims of the fluid extract. I repeated the dose every twenty minutes until one hundred minims had been given, when I paused, fearing to administer for the present more of this powerful remedy. I observed, however, when the second dose was given, that the carotids were acting with less force, and between one and two hours from the first dose the action of the carotids grew calm and dusky color of face markedly less. I now resorted to "masterly inactivity," and carefully watched my patient for near an hour; then his respiration became spasmodic and alarming. I immediately administered subcutaneously $\frac{1}{12}$ gr. sulph. strychnine in solution. Respiration soon became normal, and in view of all the features of the case I ventured another hypodermic injection of 15 minims gelsemium. Soon afterwards, perhaps thirty minutes, the patient became conscious, opened his eyes, and recognized every one present. His first desire was to urinate, and he passed an inordinate quantity. Thus in rather less than three and a half hours the patient had received subcutaneously one hundred and fifteen minims fluid extract gelsemium. Being now perfectly rational and able to sit up in bed, I left at 9.30 P.M., after giving nurses strict orders to keep him awake, walk him, etc., until 5 A.M. While walking in the yard the ipecac had its effect, producing full emesis, the ejected matters exhaling the odor of laudanum. Next morning's visit, 9 A.M., found the patient all right, but "feeling very sore."

W. D. HUTCHINGS, M.D.

MADISON, IND.

THERAPEUTIC PROPERTIES OF CORN-SILK.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—During the last three years, or ever since the introduction of corn silk as a remedy, I have had ample opportunity to test its therapeutic effects in those diseases for which it is recommended. I have no new qualities of this drug discovered, but merely desire to corroborate the statement of other physicians, who speak in favor of this remedy. My experience with the fluid extract of corn silk has been most satisfactory in every respect, having used it in many different forms of acute and chronic diseases of the kidneys and bladder, and I find it a valuable remedy in these ailments. In all catarrhal disorders of the genito-urinary organs I find it superior to other medicaments I formerly tried. I have used it in retention and suppression of urine in adults and infants with the best success. In the acute stage of gonorrhœa, alternated with alkalies, it will relieve the scalding in passing water, allay pain, and shorten the first stage. In organic heart-disease, when there is deficiency of urine, it will act as a mild but certain diuretic, increasing the flow of urine when other stimulating diuretics have failed to produce diuresis. The fluid extract of corn silk, given in drachm doses, will also relieve the periodical attacks of dyspnœa in this trouble, and, alternated with 15 drops of the fluid extract of cereus bonplandi, I consider these two remedies as excellent palliatives in functional as well as organic ailment of the heart, believing that, besides its demulcent and diuretic actions, corn silk has considerable anodyne properties.

In regard to dosage, I found that in acute renal diseases, or in retention or suppression of urine, where a decided action is required, full doses—1 to 2 drachms of the fluid extract, well diluted with water—may be given, repeated every two or three hours until the desired result is obtained. In chronic cases, 20 minims to ½ drachm, four times daily, in a wineglassful of water, an hour before meals, acts best. It may be given for weeks or months without deranging digestion, but the doses will have to be increased if given for any length of time. Therefore it is well, after giving the corn silk for two or three weeks in chronic renal cases, to alternate with other mild diuretics, such as buchu and acetate potassæ. Notwithstanding the fact that corn silk is an excellent remedy in irritable bladder when given in small doses, it will, when exhibited in large or overdoses, to a healthy person or in subacute cases, cause irritability of the bladder, palpitation, and restlessness; but these symptoms are easily relieved by some effervescent draught, such as citrate or bromide potassium.

If the preparation of corn silk has not been successful in the hands of some physicians, they very likely used an inferior article, as I myself was disappointed in its action when I prepared a saturated tincture from the green corn silk, or was furnished by my druggist with some weak preparation.

A. CRULL, M.D.

DITTMER'S STORE, MO.

Notes and Queries.

NOTE ON TWO ANTIPYRETICS.

I.—ANTITHERMIN.

$CH_3C(C_6H_5N-NH)CH_2-CH_2COOH$.

Under this name M. NICOT publishes in the *Nouv. Remèdes*, 1887, 102, a new antipyretic, phenylhydrazin,—levulinic acid,—which is, chemically, closely related to antipyrin.

Commencing with phenylhydrazin, $C_6H_5-NH-NH_2$, we may state that this body shows, almost more than any other that is to be met with in modern chemistry, the greatest reactive powers. Thus it has the quality of combining with aldehydes, ketone sugars, and forming with them perfectly well characterized and crystallized compounds. It shows the same properties also with regard to ketone acid and its ether. For instance, it combines with acetoacetic ether to the basis called monomethylchinizin, of which antipyrin is a methyl compound.

To the substances which combine with phenylhydrazin *levulinic acid*, $C_5H_8O_3$, belongs. This latter is obtained by applying dilute acid to levulose.

The mode of preparation of antithermin is as follows: Phenylhydrazin is dissolved in dilute acetic acid; on a solution of levulinic acid being added a yellow precipitate is formed, which, by means of crystallization from an alcoholic solution, produces well-formed crystals of phenylhydrazin-levulinic acid of the above-mentioned constitution, and possessed, as is affirmed, of antipyretic powers.

Regarding the dose to be administered, manner of application, and clinical experience, nothing is as yet known.

II.—ACETPHENETIDIN.

This is a German discovery. MESSRS. O. HINSBERG and A. KAST announce in the *Centralblatt f. d. Med. Wissenschaft*, 1887, No. 9, that *p*-acetphenetidin is possessed of considerable antithermic properties, as shown by a series of experiments (*Pharm. Zeit. Berlin.*, March 26, 1887). They gave doses of 3 to 8 grains, and were able in this manner to reduce the temperature of the human body on an average by 2° C. without any unpleasant secondary effects.

The preparation consists of colorless needles, which are soluble in water, still more so in alcohol and glacial acetic acid, and are devoid of taste. Their melting-point is 135° Celsius.

From these first communications it was not quite clear which chemical body was meant by acetphenetidin, it being also spoken of by others as "ascetphenidin," but since then the manufacturers have explained that acetphenetidin is the acetyl derivative of phenetidin,—that is, of the ethylether of paramidophenol.

The formula is

$$\begin{array}{l} OC_2H_5 \\ | \\ C_6H_4 \\ | \\ NH(CO-CH_3). \end{array}$$

It is obtained from carbolic acid by the process of nitriting, separation of the ortho- and para-nitrophenols, acetylating the latter, reducing the *p*-nitrophenol to *p*-amidophenol, which is called phenetidin, and acetylating the phenetidin with glacial acetic acid.

Antithermin and acetphenetidin are, therefore, now added to antifebrin, salol, chinolin, kairin, antipyrin, and thallin, the half-dozen of the newest and best-known antipyretics.

Antipyrin and antifebrin have indeed proved very formidable rivals of quinine, which, however, retains after all the first place among febrifuges.

Antithermin possesses, at least, a very promising name, which in any case is of some worth.

Acetphenetidin has not yet received an abbreviated appellation. Perhaps "anticalorin" would sound well, although by no means correctly chosen. Why have none of the discoverers thought of calling a preparation "antiquinine"? for this search after new antipyretics is surely more often aimed at rivalling quinine than anything else. Concerning these latest productions of the antiquinine movement we must as yet await further tests and proofs.—*Pharmaceutical Record*, May 1, 1887.

IODOFORM AND CALOMEL.

An incompatibility observed in a mixture of iodoform and calomel has been investigated by MR. DRESCHER with a view to ascertain the chemical change that takes place. Equal parts by weight of the two substances, when triturated together in a porcelain mortar, manifested no change of color, nor was there any noticeable reaction or foreign odor. Some of the powder, when placed in a white vial, well corked and exposed to direct sunlight, showed at the end of one hour signs of decomposition. After five hours the powder exhibited all phases of color from whitish to yellow, with numerous greenish and grayish specks. There

was also at the top some bright orange-red powder, which proved to be mercuric iodide. Another portion placed in an amber-colored vial and exposed to direct sunlight, behaved somewhat similarly, except that the decomposition took about three times as long. A third portion, placed in an amber-colored bottle and exposed to diffused light, showed no signs of decomposition at the end of one week, but after two weeks change was quite evident. Some of the powdered mixture, gently heated in a test-tube, gave off the odor of chloroform, especially when the iodoform and calomel were used in proportional quantities, and there was a formation of mercurous iodide, which, upon the temperature being raised, was converted into mercuric iodide. The reaction supposed to have taken place is—

$$2CHI_3 + 3Hg_2Cl_2 = 2CHCl_3 + 3H_2I_2.$$

—*Pharmaceutical Journal and Transactions*, April 30, 1887.

AN ANTISEPTIC FLUID FOR USE ABOUT THE EYE.

GRANDMONT reports a case of occluded lachrymal duct, in which he opened the duct and disinfected it with the following fluid :

Chloral. hydrat.,
Sodii salicylat., aā gr. viii;
Aquæ, ʒl.

—*Les Noveaux Remèdes*, No. 8.

GASEOUS RECTAL MEDICATION IN PHTHISIS.

A fresh series of observations by M. PERRET appears to result in conclusions in general harmony with other recent trials of the method. He states that the gaseous injections have no microbicidal action ; they can modify the bronchial phenomena and diminish expectoration, also influence nutrition for good, especially in the apyretic forms, like other medicaments, and hence are of value in relieving particular symptoms. The outcome of this appears to be that they are as good as, but no better than, other bronchial remedies.—*The Lancet*, May 28, 1887.

THE TREATMENT OF MORPHINOMANIA.

DRS. JONES and BALL have recently published an essay on the treatment of morphinomania, in which they state that they relied chiefly for the cure of these patients on nitroglycerin and sulphate of sparteine. Nitroglycerin may be administered as a one per cent. alcohol solution, while the sparteine is to be administered hypodermically in doses of from one to four centigrammes.

SO GERMAN, YOU KNOW.

["And I saw many strange things in heaven."—ST. JOHN.]

We speak of a coccus as causing the gleet,
For that is quite German, you know ;
Iodoform use, since its smell is so sweet,
For that is quite German, you know.
We dilate the rectum with hydrogen gas
To kill the bacilli that through the lungs pass,
Then put our poor patient down under the grass,
For that is so German, you know.

A man may be shot in a glorious cause,
For that is quite German, you know ;
We extract the bullet and wrap him in gauze,
For that is quite German, you know.
With carbolic acid we sozzle the wound
Until the poor fellow is up and around,
Or maybe is dead and put under the ground,
For that is so German, you know.

The comma-bacillus (we think so at least),
For that is quite German, you know,
Slips through a man's bowels as if it were greased,
For that is quite German, you know ;
We use "antiseptics" to check the discharge
(The rate of mortality still is as large),
And next disinfect his grave free of all charge,
For that is so German, you know.

We'll find that bacteria hasten divorce,
For that is quite German, you know ;
"Spirilli of homicide" follow, of course,
For that is quite German, you know.
A "microbe of lying" will be on the tongue,
And "melon-thief vibrio" found in the young,
The "germ of strong drink" will be seen at the bung,
For that is *so* German, you know !

At last when in Satan's hot home we will be
(For that is quite German, you know),
We'll use *sulphur vapors* to kill bacilli,
For that is quite German, you know.
Or if we to heaven instead emigrate,
Our harps, ere we use 'em, we will fumigate,
Our wings "sterilize" as we pass thro' the gate,
For that is so German, you know.

—*Kansas City Medical Index*, May, 1887.